University of Alberta

Impacts of Resource Development on Traditional Land Use and Traditional Ecological Knowledge of the Athabasca Chipewyan First Nation

by

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Abstract

This thesis explores the impacts of industrial resource development (e.g. oil/gas extraction and forestry) on traditional land use (e.g. hunting, trapping, and gathering) and traditional ecological knowledge, by providing a case study of the Alexis Nakota Sioux Nation community, located in west-central Alberta, Canada. In-depth interviews conducted with traditional land use experts revealed how the ongoing resource development and resource management policies are infringing on Alexis people's rights and affecting their traditional knowledge systems. Research findings were analyzed by a sociological approach, which enabled illustration of the socio-political factors that underlie Aboriginal issues in Alberta. I conclude that a combination of conflicting interests/values and imbalance in political power is causing the infringement of Alexis people's rights and the destruction of Alexis' traditional knowledge systems. I suggest that presenting health concerns to the government and increasing training opportunities would promote participation of Alexis people in resource management decision-making processes.

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1. Introduction

Traditional land use refers to the way Aboriginal peoples have utilized land and resources based on the knowledge and beliefs regarding the natural ecosystem that have been gained through lived experience. Such knowledge and beliefs are often called "Traditional Ecological Knowledge (TEK)." Berkes et al. (2000:1252) define TEK as "a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment." Since Aboriginal peoples have lived very close to nature for millennia, some scholars believe that they have learned how to wisely utilize their surrounding natural resources without destroying the balance between humans and the environment (Wolfley, 1998), and their knowledge is increasingly recognized as having importance for contemporary natural resource management (Stevenson, 1998).

However, traditional land use has been restricted and oppressed in many ways since the Europeans settled this continent (Whiteman, 2004b). Though the government has provided reserves and some basic rights, many Aboriginal peoples are continuously impacted by various resource development activities (e.g. oil and gas extraction, forestry, cattle ranching, mining, hydroelectric development, etc.) that significantly reduce opportunities for traditional land use activities (e.g. hunting,

trapping, gathering, and fishing) (Whiteman, 2004b). Such developments not only infringe on their rights and culture, but also lead to increased environmental impacts since industry-led resource development activities are considered less ecologically sustainable compared to traditional land use practices (Wolfley, 1998). Due to insufficient legal support and an entrenched political power structure, impacts on traditional land use remain significant (Natcher, 2001; MacKinnon, Apentiik, and Robinson, 2001).

In order to better understand the relationship between traditional land use activities and industrial resource development, it is necessary to assess the perceived impacts of resource development from the perspective of traditional land users themselves. However, not enough research has been done to study the impacts of resource development on traditional land use particularly from an Aboriginal perspective. Further, while the majority of literature concerning TEK emphasizes the difficulties and potentials of incorporating TEK into contemporary resource management systems, few studies have clarified the process of how TEK is being influenced by various external pressures.

This research explores the impacts of industrial resource development on traditional land use practices and TEK from the perspectives of traditional users themselves, focusing on the Alexis Nakota Sioux Nation community of west-central

Alberta, Canada. In-depth interviews were conducted based on the following research questions. 1. How do traditional land users view the major impacts of industrial resource development on traditional land use? 2. What types of resource development are perceived as having the most significant impact on traditional land use? 3. What are the long term implications of these impacts for TEK? 4. What are some potential planning alternatives that government, industry, and the Alexis Nakota Sioux Nation might employ in order to protect traditional land use practices and TEK? The findings from this research will not only provide useful information for improving relationships among the government, industry, and First Nations, but also for promoting sustainable resource management in Alberta.

2. Background Information

2.1 General Information about the Alexis Nakota Sioux Nation

2.1.1 Origin and History

It is said that the Alexis people have their origin in the Stoney group, who represents the most northwestern of Siouan speaking communities in the Great Plains (Getty and Gooding, 2001). The peoples of Alexis have appeared in the early records as "Assiniboine", which can be translated into "Stone people" in the Cree language, and this created the English term "Stoney" (Dempsey, 1997; Schramm, 2005a). The Stoney people are said to have separated from the Sioux Nation before 1640 (Dempsey, 1997). Stoney people consist of two groups, the Mountain Stoney and the Wood Stoney (Getty and Gooding, 2001). The Mountain Stoney are comprised of the Bearspaw, Chiniki, and Wesley (Goodstoney) Bands, residing at Morley, Alberta (Getty and Gooding, 2001). The Alexis Band belongs to the Wood Stoney group, which comprises two northernmost bands named Alexis and Paul (Getty and Gooding, 2001).

The Alexis people recently adopted a new official name, "Alexis Nakota Sioux Nation". This name was derived from a classification of the Siouan dialects (Schramm, 2005a). Some early linguistic researchers classified the Siouan dialects into d, l, and n language groups, which are known as Dakota, Lakota, and Nakota

respectively (Parks and DeMallie, 1992 as cited in Schramm, 2005a). Since the dialect used by Alexis people was classified as Nakota, they have now come to use the name "Alexis Nakota Sioux Nation" (Schramm, 2005a), although the use of the term "Nakota" was already acknowledged by an early scholar (Rodnick, 1937). However, many Alexis people also identify themselves and their own language as "Isga" (Schramm, 2005a).

The ancestors of the Alexis people are considered to have lived near the headwaters of the Mississippi, gone north and became allies with the Cree, and moved westward (Dempsey, 1997). They entered the foothills of the Rockies west of Edmonton by 1650 or earlier (Laurie, 1957 as cited in Andersen, 1971). Some studies indicate that the Cree and the Stoney got equipped with firearms, migrated from the region around Lake Winnipeg into this area, and joined the fur trade around 1670 (Ewers, 1967 as cited in Andersen, 1971).

Within Alberta, Stoney people were divided into two main groups; one was the people who hunted buffalos on the plains, and the other was the people who lived in the woodland regions (Dempsey, 1997). Stoneys were said to be excellent hunters, particularly skillful in trapping buffalos (Dempsey, 1997). Furthermore, they were said to be very hospitable to strangers (Dempsey, 1997). Although they traveled together and kept peaceful relationships with the Cree, sometimes allowing

intermarriage, they always maintained their own language and did not lose their Stoney identity (Andersen, 1971). The Stoney came into regular contact with European settlers after 1770, when the fur trade in western Canada started between the Stoney people and the European trading companies that brought goods from Europe and central Canada (Getty and Gooding, 2001).

On behalf of the Stoneys of the Pembina and Athabasca River region, Chief Arannazhi signed an adhesion to Treaty Six with the British Crown at Edmonton on August 21, 1877 (Morris, 1880 as cited in Getty and Gooding, 2001; Schramm, 2005a). He is the person who became known as Chief Alexis, and the reserve located at Lac Ste. Anne on which his followers settled came to be known as the Alexis Reserve (Schramm, 2005a). The Alexis Reserve was placed on a shore of the sacred lake called Wakamne, meaning God's lake (Simon, 1995; Schramm, 2005a). The Lake Wakamne was renamed Lac Ste. Anne by the missionary Father Thibault, who established a Catholic mission at the lake. Due to the influence of the mission, a large number of Stoneys converted to Catholicism in subsequent years (Simon, 1995 as cited in Schramm, 2005a).

After the treaty was signed between Chief Alexis and the British Crown, the band residing on the Alexis Reserve was divided into two groups, the Lac Ste. Anne (Alexis) group and the Wabamun Lake (Paul) group, due to economic and religious

reasons (Andérsen, 1971). One possible reason is that some band members thought the fish supply at Wabamun Lake was more reliable than the one at Lac Ste. Anne (Andersen, 1971). Another reason is that the leader of the Lac Ste. Anne group was Roman Catholic, while a number of his followers were Protestant (Andersen, 1971). Thus, roughly half of the band members had moved to the Wabamun Lake area (Andersen, 1971). This Wabamun Lake group joined a similar Protestant group that separated from Alexander's Band of Cree (Andersen, 1971). As a result, the Lac Ste. Anne group has become the Alexis' Band, and the Wabamun Lake group has come to be known as Paul's Band, which today is known as Paul's First Nation (Andersen, 1971).

Although Catholicism strongly influenced the Alexis Band, they still maintained their cultural identity and their strong ties with the land by practicing traditional hunting and trapping activities (Schramm, 2005a). While many other Stoney bands frequently camped and hunted together, the band under Chief Alexis maintained some distance from the other bands (Dempsey, 1997). Despite the fact that many Alexis children had to spend their childhood at a residential school, many families still continue to camp in a traditional way, especially during summer and fall seasons, when they hunt, trap, and gather berries and plants (Schramm, 2005a).

According to the Aboriginal Peoples' Survey conducted in 2001, the total

Aboriginal identity population of 800 lived in the Alexis reserve area of 54.66 km^2 (Statistics Canada, 2006). This survey also showed that 51% of the adults hunted, 67% of the adults gathered wild plants (berries, sweet grass, etc.), 27% of the adults fished, and 9% of the adults trapped, mostly for food, in the past 12 months (Statistics Canada, 2006). 89% of the adults answered that they can speak or understand an Aboriginal language, and 78% of adults says that keeping, learning or re-learning an Aboriginal language is very important (Statistics Canada, 2006). These data show that a significant portion of the Alexis population is still embedded in their traditional culture.

2.1.2 Traditional Sites

The traditional hunting territory of the Alexis people ranges from Drayton Valley in the south along the foothills and Rocky Mountains, reaching Whitecourt and the Swan Hills in the north, and Barrhead in the east (Schramm, 2005a). The Alexis Nakota Sioux Nation has four reserves in four different locations: Whitecourt, Cardinal River, Lac Ste. Anne, and Grave Flats. The area surrounding Whitecourt, Cardinal River, Cynthia, Lodgepole, and Lac Ste. Anne (Wakamne) are the most important sites for traditional land use for the Alexis Nakota Sioux Nation (Alexis Nakota Sioux Nation, 2006).

The Whitecourt Reserve is located in the Mid Boreal Mixedwood Ecoregion in central Alberta, situated approximately 10 km northwest of the town of Whitecourt (Alexis Nakota Sioux Nation, 2006). The area is dominated by lodgepole pine, white spruce, and black spruce forests, and is considered as the only habitat for grizzly bears outside the mountain regions of western Canada (Alexis Nakota Sioux Nation, 2006). An intersection of two streams, Sakwatamau River and Carson Creek, is also located in the Whitecourt region (Alexis Nakota Sioux Nation, 2006). A number of oil and gas pipelines run through the reserve (Alexis Nakota Sioux Nation, 2006).

Cardinal River is located approximately 20 km east of Jasper National Park, along the eastern fringe of the Rocky Mountains (Alexis Nakota Sioux Nation, 2006). This region lies within the Subalpine and Alpine Ecoregions, characterized by lodgepole pine and Engelmann spruce forests (Alexis Nakota Sioux Nation, 2006). Wildlife such as moose, mule deer, grizzly bear, mountain sheep and mountain goats inhabit this area (Alexis Nakota Sioux Nation, 2006).

Currently, the Alexis Reserve is situated at Lac Ste. Anne (Wakamne), located approximately 50 miles northwest of Edmonton (Andersen, 1971). This area lies within the Mid Boreal Mixedwood Ecoregion in central Alberta, and is dominated by poplar and aspen forest with intermittent stands of white spruce and balsam fir (Alexis Nakota Sioux Nation, 2006).

2.1.3 Spiritual Beliefs

The traditional spiritual beliefs of the Sioux people are largely based on the concept of "wakan", which combines the meanings of spiritual force, power, and sacredness (Marino, 2002). Wakan resides in nature, and the Sioux people believe in "wakan-tanka", the Creator, which is the supreme being (Marino, 2002). They also believe in lesser supernatural beings that can appear, for example, in the forms of eagles, hawks, and bison (Marino, 2002). It is considered that everything in nature, including human beings, animals, plants, landforms, soils, bodies of water, and rocks, were placed by the Creator, and are a source of wakan (Marino, 2002). The Sioux people believe that human beings are not created to dominate the natural world, and that all nature must be treated with respect (Marino, 2002). In other words, human beings may take only what they need from nature by asking permission and giving appreciation (Marino, 2002). This is an important concept that underlies the Sioux people's spiritual beliefs and relates directly to the values they associate with land use (Marino, 2002). This concept also underlies all the issues that the Alexis people have with the way non-Aboriginal people use the resources of the land.

Spirituality is a fundamental part of Alexis people's life, just like many other Aboriginal peoples. One of the important rituals where they express their spirituality is called the "Sun Dance"; other various ceremonies include naming of children,

spiritual quests, rites of passage, and communal celebrations (Lowie, 1909, Snow, 1977 as cited in Getty and Gooding, 2001). They might seek spiritual power and guidance on vision quests, typically held at sacred areas in the mountains (Getty and Gooding, 2001). However, Christianity has largely influenced their traditional beliefs and ceremonies since Roman Catholic missionaries came into the area, built churches, and taught them about Christianity (Getty and Gooding, 2001).

2.1.4 Traditional Food Source

Historical records indicate that the Alexis people practiced hunting and fishing especially in the summer and fall months, trapping in fall and winter, and gathered plants in the forested rivers and foothill regions between the Athabasca and North Saskatchewan rivers west of Edmonton (Andersen, 1971). They also roamed around the area northeast of Edmonton including the Lac La Biche region (Andersen, 1971). While they hunted wildlife in small social units in forested areas during winter, they shifted to buffalo hunting on the plains by forming large groups during summer (Andersen, 1971). They tend to practice traditional activities in wooded environments or swampy areas, such as small lakes and creeks (Andersen, 1971). Unlike many other tribes, fish was also an important source of diet among the Stoneys (Getty and Gooding, 2001). Stoneys learned the skill to trap moose with a snare, made of

rawhide ropes (Curtis, 1907-1930 as cited in Getty and Gooding, 2001). They used spears, arrows, hooks, bones, and willows to catch fish (Getty and Gooding, 2001). They also made bows from birch and willows, and arrows from serviceberry shoots (Getty and Gooding, 2001).

The Alexis people are still largely dependent on wildlife that inhabits the surrounding environment. Today, their major food sources include moose, elk, deer, beavers, muskrats, rabbits, ducks, prairie chickens, geese, and fish (Alexis Nakota Sioux Nation, 2006). In the past, bear, porcupine, groundhog, lynx, and maybe bison were also part of the diet (Alexis Nakota Sioux Nation, 2006). Meats of moose, deer, elk, and occasionally buffaloes are prepared as lightly smoked dry meat (Alexis Nakota Sioux Nation, 2006). The meat is cut into thin slices, hung up over the smoking logs, and smoked for at least two days (Alexis Nakota Sioux Nation, 2006). Elders use the insides of moose, elk, and bison (heart, kidneys, liver, bile, tripe, moose nose and tongue) for feasts and sacred ceremonies (Alexis Nakota Sioux Nation, 2006).

Alexis people also have some other ways to cook wild meat, such as Moose Nose Soup (a moose nose boiled with raisin and flour), Pemmican (pounded dried meat wrapped in canvas), Rabbit Soup (rabbit meat boiled with carrots, celery, potatoes and flour), and Duck Soup (cooked with potatoes, carrots, and barley)

(Alexis Nakota Sioux Nation, 2006). Moose nose as well as pemmican is prepared for traditional feasts and ceremonies (Alexis Nakota Sioux Nation, 2006). Beavers, muskrats, groundhogs, and porcupines were also very important food sources, served smoked and boiled with potatoes and vegetables (Alexis Nakota Sioux Nation, 2006).

2.2 Economic Significance and Ecological Concerns regarding Resource Development in Alberta

2.2.1 Oil and Gas Development in Alberta

Alberta's economy is largely driven by energy related industries. Approximately one-third (about $9.74 billion in 2004-2005) of the total revenue collected by the province came from energy related royalty revenues (Alberta Energy, 2006). These revenues help to keep Alberta's taxes low, and are essential for enhancing public services such as health and education (Alberta Energy, 2006). Moreover, the energy industry accounts for nearly seventy percent of the value of Alberta's $66 billion of exports and about one-quarter of the total $170 billion in Gross Domestic Product (GDP) (Alberta Energy, 2006). Almost one in every six workers in Alberta is employed directly or indirectly in the energy sector (Alberta Energy, 2006).

Alberta's oil industry started with the successful discovery of a rich oil field

at Leduc, located south of Edmonton, in 1947 (Alberta Energy, 2006). Today, conventional crude oil production is the second largest source of non-renewable resource development income for Albertans, producing more than $3.4 billion in royalty payments to the provincial government from the fiscal year 2002/2003 to 2004/2005 (Alberta Energy, 2006). The oil industry supports thousands of jobs in exploration, production, transportation, refining, distribution, and marketing (Alberta Energy, 2006). In 2004, Alberta's total crude oil production reached 23.6 percent of Canada's entire crude oil production, which amounts to approximately 7.5 percent of the total North American crude oil production (Alberta Energy, 2006). Further, the rapid growth of the oil industry has led to a development of extensive infrastructure that contributed to locating, drilling, and transporting the oil to markets (Alberta Energy, 2006).

Since large sinks of natural gas were found in the 1940s, the gas industry has grown to become a huge economic force in Alberta (Canadian Association of Petroleum Producers, 2006a). Alberta produces over eighty percent of the natural gas in Canada (Alberta Energy, 2006). Natural gas is the largest single source of resource development revenue in Alberta, accounting for more than $28.2 billion in royalties paid to the Government of Alberta in the fiscal year 2000/2001 to 2004/2005 (Alberta Energy, 2006). This number indicates that approximately 70 percent of all provincial

revenue from non-renewable resources comes from the natural gas industry (Alberta Energy, 2006). Natural gas also plays an important role in the oil and gas industry's investment in Alberta, reaching over $90 billion between 2000 and 2004 (Alberta Energy, 2006).

However, scientists point out that the seismic operations conducted by the oil and gas industries, which remove extensive areas of Alberta's boreal forests, have enormous impacts on the surrounding ecosystems (Schneider, 2002). 924,016 km of seismic lines were approved in Alberta's Green Area, and approximately 4,971.11 km^2 of boreal forest was cleared for cut-lines, between 1979 and 1995 (Alberta Environmental Protection, 1998 as cited in Schramm, 2005b). 3,221 oil wells and 13,268 natural gas wells were drilled in 2005 (Canadian Association of Petroleum Producers, 2006b). In the same year, 571,000 barrels of conventional oil and 13.3 billion cubic feet of natural gas were produced per day (Canadian Association of Petroleum Producers, 2006b). The areas of forest cleared for the purpose of seismic operations in the Green Zone between the 1950s and 1970s almost equals the forest area harvested by forestry industry, and the trees cut for seismic operations are mostly wasted (Schneider, 2002). Fragmentation of forests caused by oil extraction gives huge impacts on forest interior species (Bender et al.1998 as cited in Schneider, 2002) and birds that are vulnerable toward nest predation or parasitism (Burke and Nol,

2000 as cited in Schneider, 2002). Increased hunting and poaching, increased sediments in streams, erosion and compaction of soil, introduction of aggressive weed species (Canadian Association of Petroleum Producers, 1999a as cited in Schneider, 2002), and alteration of predator-prey interactions (James, 1999 as cited in Schneider, 2002) are some of the major ecological impacts.

Moreover, drilling and construction of oil and gas wells also negatively affect the environment. 11,898 new oil wells were drilled in Alberta during the year 2000 (Alberta Energy, 2001 as cited in Schneider, 2002), and approximately 886 km^2 had been occupied by oil wells by 1997 (Alberta Environmental Protection, 1998 as cited in Schneider, 2002). Clearing of forests to construct oil wells, and building of access roads and pipelines generally have similar ecological impacts as seismic operations (Canadian Association of Petroleum Producers, 1999b as cited in Schneider, 2002). In addition, oil drilling activities produce various environmental contaminants such as hydrocarbons, saline water, heavy metals, and acids which largely reduce water and soil quality (Alberta Energy and Utilities Board, 1996 as cited in Schneider, 2002). Many contaminants are considered hazardous or toxic (Alberta Energy and Utilities Board, 1996 as cited in Schneider, 2002). Oil drilling and production also pollutes the air by producing toxic chemicals such as benzene, carbon monoxide (Canadian Association of Petroleum Producers, 1999b as cited in Schneider, 2002), sulfur

dioxide, and nitrogen dioxide (Schindler, 1998 as cited in Schneider, 2002). Furthermore, the huge methane and carbon dioxide emissions from oil extraction activities make Alberta the province with the highest greenhouse gas emissions in Canada (Environment Canada, 1997 as cited in Schneider, 2002).

2.2.2 Forestry in Alberta

Forestry plays a significant role in Alberta's economy, generating annual revenues of nearly $8.4 billion (Alberta Forest Products Association, 2006). Alberta's forests produce a wide variety of wood products including: lumber, plywood, Oriented Strandboard (OSB), Medium Density Fibreboard (MDF), pulp, newsprint, cabinetry for kitchens and bathrooms, wood doors and windows, beams, laminated wood, hardwood flooring, office furniture, home furniture, pre-fabricated buildings (modular buildings, houses, garages), wooden boxes and pallets, remanufactured goods (fence pickets, snow fences) (Alberta Forest Products Association, 2006). These products are shipped to markets not only in Alberta and other parts of Canada, but also to the United States, Europe, and Asia-Pacific (Alberta Forest Products Association, 2006). Alberta's forestry sector provides almost 54000 jobs, generating $1.6 billion in household income (Alberta Forest Products Association, 2006). Further, 15000 other jobs are indirectly related to the forest product industry through supplier

and service providers (Alberta Forest Products Association, 2006). Of 50 communities in Alberta whose primary industry is forestry, 12 communities are forestry dependent (Alberta Forest Products Association, 2006).

However, many scholars express concern toward the dramatic increase of timber harvesting caused by the forest management regulatory frameworks developed in recent history. In the beginning of the 20th century, timber was mostly used for firewood, and the impact on the forests of Alberta was minimal (Schneider, 2002). The demand for timber gradually increased as settlers came in and started to build railroads (Schneider, 2002). However, forestry practices in the first half of the 20th century were generally small-scale or family-based, serving local markets with local mills, and timber harvesting rates were still low (Schneider, 2002). The harvest rates in Alberta rapidly increased with World War II largely due to expanding demands for exports, and it continued to increase until the end of the 20th century (Schneider, 2002).

During the first half of the 20th century, foresters simply looked for the largest and the most valuable trees and harvested them selectively (Schneider, 2002). However, as timber harvest started to increase, the government initiated a regulation aiming at sustained yield of timber, in order to ensure that the rate of harvesting does not exceed the rate of forest growth (Schneider, 2002). Under this regulation, foresters

started to rely on clear-cutting and artificial regeneration instead of practicing selective logging, in order to maximize harvest rates (Schneider, 2002). After the World War II, enormous efforts were made to increase productivity through technological improvement (Schneider, 2002). Building of more than a dozen new wood-processing facilities in the late 1980s further accelerated timber harvest rates, reaching more than five times what it had been in the 1970s (Schneider, 2002). Such substantial increase in forest harvesting would have the same types of ecological impacts as observed in seismic operations, as described in the previous subchapter.

In addition, it is also important to note that the government's permission for herbicide use has grown from almost none to 32,000 ha between 1994 and 1999 (Schneider, 2002 as cited in Schramm, 2005b). Furthermore, between 1999 and 2004, approximately 342,000 ha of forested land were treated with herbicides in Alberta and British Columbia (Canadian Council of Forest Ministers, 2004 as cited in Strong and Gates, 2005). Glyphosate (Vision) and Triclopyr (Release) are some of the common silvicultural herbicides used for controlling competitors when regenerating forests, but one study found that they can reduce species richness and diversity (Newsmaster, Wayne, and Dale, 1999). Another study of the effects of herbicide on ungulate forage in hardwood forest clear-cuts suggested that the cumulative effects of herbicides reduce winter ungulate and summer elk forage availability compared to untreated

conditions (Strong and Gates, 2005). These studies show how increasing herbicide use may cause negative impacts on the ecosystem.

2.2.3 Cattle Ranching in Alberta

Cattle ranchers also contribute to Alberta's rural economy. Alberta's cattle industry started to grow by the end of World War II, and now it annually generates three billion dollars and creates employment for more than 1800 people (Alberta Cattle Feeders' Association, 2006). According to the Livestock Inventory Estimates released by Statistics Canada in January 2006, Alberta had a total of 5.9 million cattle (Alberta Agriculture and Food, 2006). Further, spin-off benefits produce more than $10 billion, generating thousands of jobs in the supply/service sector (Alberta Cattle Feeders' Association, 2006). In 2003, there were 5,700 grazing leases that roughly covered five million acres (5% of Alberta's public lands), mostly provided on unforested or settled lands of the province (Wenig, 2005). Nearly 10% of all agricultural land in Alberta is grazing land (Wenig, 2005). Alberta beef is not only supplied in Alberta and Canada, but also is exported to countries such as the United States, Mexico, Japan, South Korea, and Taiwan, which were the top five export markets between 2000 to 2003 (Alberta Cattle Feeders' Association, 2006). Alberta's cattle production accounts for 68 percent of the entire cattle production in Canada,

making Alberta the largest beef producing province (Alberta Cattle Feeders' Association, 2006).

3. Literature Review

3.1 Positive and Negative Views toward Traditional Land Use and Traditional Ecological Knowledge

Interested groups have both positive and negative views concerning traditional land use activities. One major positive concept is that traditional land use practices are based on the idea that humans are a part of the natural ecosystem and are intimately connected with all other beings on earth (Stevenson, 1998). From the Aboriginal peoples' perspective, the role of human beings is to maintain a sound relationship with our surrounding ecosystem so that we can live in harmony with nature (Stevenson, 1998). For example, forest management practices conducted by the Aboriginal people in northern coastal British Columbia are designed to conserve the entire forest ecosystem's multiple age classes and diverse structures by maintaining both hardwood and coniferous trees (Pinkerton, 1998 as cited in Berkes et al., 2000). They are concerned with maintaining all ecological processes including those involving soil bacteria and do not focus only on fiber production (Pinkerton, 1998 as cited in Berkes et al., 2000). The James Bay Cree's fisheries' practices maintain multiple reproductive year classes by mandating the catching of different sizes of adult fish instead of harvesting only the largest fish, and these practices appear to be very effective in conserving reproductive resilience (Berkes, 1998 as cited in Berkes

et al., 2000). This approach differs greatly from the dominant industrial land use practices, which are undertaken according to a completely different world-view based on the assumption that humans are above nature and apart from it, and that a company's own interests entitle them to control natural resources and other living organisms (Stevenson, 1998). In addition, it is said that traditional land use practices are based on long-term observations and experiences, whereas dominant land use management relies mainly on research conducted in a short-term period. For instance, ethnohistorical information suggests that James Bay Cree hunters are managing caribou populations on an 80-100 year scale (Berkes, 1998 as cited in Berkes et al., 2000). Some empirical findings confirm that Aboriginal peoples kept their lands and resources in an ecologically sound condition in spite of all the hunting, fishing, and burning that was conducted, and thus many people believe that Aboriginal peoples' traditional land use practices are more sustainable than the dominant, industrialized land use activities (Wolfley, 1998).

In contrast to an idealized view that Aboriginal peoples never overexploited their natural resources, some research findings indicate that Aboriginal peoples have indeed over-harvested wildlife and potentially had a huge impact on various wildlife populations and local ecosystems. These findings suggest that the Native Americans' continuous hunting activities significantly reduced ungulate populations in the Rocky

Mountains, for example (Kay, 1994). Bison were once abundant in the Canadian Rockies, but Aboriginal peoples' intensive hunting activities might have contributed to the reduction of their population (Kay, 2001). Moreover, Aboriginal peoples' preference for hunting prime-age female ungulates might have had a critical impact on the bison population's reproductive survival (Kay, 1994).

Others insist that traditional land use is still ecologically sustainable despite such findings. They argue that traditional land use is constantly evolving through ongoing ecological practices and Aboriginal peoples are also learning from their experiences (Whiteman, 2004a). In other words, some Aboriginal peoples may have over-consumed resources in the past, but as Aboriginal peoples continue to live very close to nature, they tend to adapt their behaviors when indicators of unsustainability emerge (Whiteman, 2004a). In fact, when the caribou population declined in the 1910s, the Cree people adjusted their management system to ensure sustainability (Berkes 1999, as cited in Berkes et al., 2000). The beaver-management rules established by the James Bay Cree are another example of how traditional land use practices were revised for the purpose of restoring wildlife populations (Berkes et al., 2000). As a result of continuous improvements, many Aboriginal groups have developed a set of principles that restrict over-consumption and waste of resources (Schramm and Krogman, 2001; Schramm, 2005b).

Although traditional land use and TEK are drawing attention world-wide, some researchers point out that traditional knowledge and language are disappearing at an alarming rate throughout the world, due to rapid social, political, and economic change (Maffi, 2002). This is partly because many indigenous peoples voluntarily or unwillingly choose to communicate in more dominant and prestigious languages and stop teaching their native language to their children (Maffi, 2002). Since TEK is transmitted to the next generations with the help of traditional languages, loss of traditional languages inevitably leads to losses of TEK (Maffi, 2002). Further, an increasing numbers of indigenous peoples are shifting their ways of life from traditional to modern ones (Altamirano, 2004). For instance, the Aboriginal leaders who were strongly against the Mackenzie Valley pipeline 25 years ago have now become supporters of the project, because they are starting to recognize that they cannot live in a traditional way as they did in the past, and that they need jobs to survive in the modern society (Altamirano, 2004). Due to intensive resource extraction activities conducted by industry, Aboriginal peoples are starting to feel that they may not be able to survive only by relying on traditional land use practices (Altamirano, 2004). The imposition of a market-based economy and industrial development is leading to losses of traditional culture (Altamirano, 2004).

3.2 Policies and Legal Status concerning Traditional Land Use and Traditional Ecological Knowledge

Although there are different views toward traditional land use practices, both international and national support for the recognition of traditional land use, TEK, and Aboriginal rights are strongly evident (MacKinnon, Apentiik, and Robinson, 2001). Along with the rise of environmental awareness world-wide, Aboriginal peoples' way of life, which is considered by many to be more sustainable than western industrial lifestyle, has been drawing attention from various natural resources and environmental sectors (Hayashi, 2006). For instance, the Rio Declaration on Environment and Development, the Convention on Biological Diversity, the Forest Stewardship Council, Canada's National Forest Strategy, and the Canadian Council of Forest Ministers all support the need to respect traditional knowledge and traditional lifestyles (Robinson and Ross, 1997, Institute on Governance, 1998, and Higgins, 1998 as cited in MacKinnon, Apentiik, and Robinson, 2001). The National Forest Strategy states that "Aboriginal peoples have an important and integral role in forest development, planning and management" and that "forest management in Canada, therefore, must recognize and make provision for Aboriginal and treaty rights and responsibilities, and respect the values and traditions of Aboriginal peoples regarding the forests for their livelihood, community and cultural identity" (Ross, 2003:14).

In addition, several pieces of Canadian legislation that affirm this view have been recently adopted. The First Nations Land Management Act adopted in 1999 gives First Nations the right to self-govern, manage and protect their reserve lands and resources (Indian and Northern Affairs Canada, 2005). Section 35 (1) of the 1982 Constitution Act of Canada recognizes the existence of Aboriginal and treaty rights of Indian, Inuit, and Métis peoples, and it obliges the Federal Government to consult with Aboriginal communities when their land management decisions may infringe on Aboriginal or treaty rights (Natcher, 2001). At the case of *Sparrow* in 1990, the Supreme Court of Canada upheld Aboriginal peoples' right to fish for food and for social/ceremonial purposes (Sutherland, 2000). Further, in 1999, the Canadian Supreme Court in the *Marshall* case confirmed that the Mi'kmaq, Maliseet and Passamaquoddy peoples in the Maritimes and Quebec provinces have a right to fish commercially (Sutherland, 2000). Moreover, and most pertinent to the current study, recent court decisions in Canada reaffirmed that the government is required not only to provide thorough information regarding potential impacts of development projects to Aboriginal communities, but also to give opportunities for Aboriginals to respond to government initiatives (Natcher, 2001). One such source of information consists of Traditional Land Use and Occupancy Studies (TLUOS). The Arctic Institute of North America at the University of Calgary has conducted several TLUOS, in which they

studied and documented traditional and contemporary land use patterns of Aboriginal communities for the purpose of identifying and protecting important traditional land use practices (MacKinnon, Apentiik, and Robinson, 2001). The Government of Alberta released the Aboriginal Policy Framework in 2000, and they also passed a new consultation policy called the First Nations Consultation Policy on Land Management and Resource Development in 2005 that requires industry to consult with First Nations where industrial development may infringe on treaty rights and traditional land use (Aboriginal Affairs and Northern Development, 2005).

However, there are also a number of historical processes that have led to a disempowerment of Aboriginal peoples. The Alberta Game Act approved in 1907 prohibited the hunting of bison; the Migratory Birds Convention Act signed between Great Britain (on behalf of Canada) and the United States of America in 1916 regulated the hunting of ducks and geese, which largely reduced access to Aboriginal peoples' vital food source (Schramm, 2005b). The Province of Alberta banned market hunting in 1922, depriving the Aboriginal peoples of opportunities for sustaining their livelihoods through fur trade (Schramm, 2005b). Although the policies aimed at providing equal rights to access wildlife to all citizens, white trappers were mostly in an advantageous position since white people usually had higher mobility and more money to purchase better equipments (Schramm, 2005b). One of the most crucial

changes in the legal frameworks was the Natural Resource Transfer Agreement (NRTA) signed in 1930, in which the Federal Government gave the control over the natural resources to the provincial government (Schramm, 2005b). Under this agreement, the Federal Government and the Government of Alberta agreed to apply the provincial game laws to First Nations people (Schramm, 2005b). The NRTA limited Aboriginal hunting, trapping, and fishing rights only for food, excluding the rights for commercial use (Schramm, 2005b). Moreover, the agreement only assured traditional land use rights on "unoccupied land", which does not include the land allocated to industries (Schramm, 2005b). The registered trap-line system that restricts trap-line use to an individual, requires trapping permits, and requires trappers to pay registration fees, was implemented in 1939 (Schramm, 2005b). According to Wild Fur Industry Regulations, in case a trapper fails to apply for an annual renewal within the time limit, the trapping area will be considered abandoned (Alberta Trappers' Central Association, 1980). Furthermore, the Aboriginal hunters also have to register their firearms and pay registration fees in order to purchase ammunition (Schramm, 2005b).

Partly associated with the above described history of disempowerment, there are a variety of reasons that the ability of many Aboriginal peoples to pursue their traditional land use practices is limited. The first reason is the legal status of land

management that delegates the rights to manage land and resources to provinces, while the protection of Aboriginal Constitutional rights is a federal matter. The current forest tenure system was not developed to satisfy Aboriginal interests concerning traditional land use, but it was structured to accommodate the provincial government and industry (Dickerson and Ross, 2000). The Government of Alberta's Aboriginal Policy Framework released in 2000 clearly states that only the Government of Alberta has the legal right to own and manage provincial land and resources (Ross, 2003). Since the signing of the NRTA, Aboriginal peoples are forced to work within the provincial government's regulations and requirements regarding natural resources, and the existing provincial system of rights overrides federal Aboriginal and treaty rights (Dickerson and Ross, 2000). Furthermore, the Government of Alberta basically has no legislation that is specifically designated to protect Aboriginal and treaty rights (Ross, 2003). The Government of Alberta's Aboriginal Policy Framework emphasizes the socio-economic opportunities for Aboriginal peoples rather than Aboriginal and treaty rights, constitutional obligation, and consultation (Ross, 2003). This policy asserts that the Government of Alberta will consult with Aboriginal peoples "where appropriate", and this ambiguous expression allows the government to avoid making sincere efforts for consultation (Ross, 2003:12). The fact that the government allocates tenure and resource rights to companies before consultations are done

further deprives Aboriginal peoples of the opportunities to express their concerns in land management decision-making processes (Ross, 2003). However, the Alberta Government's new consultation policy, adopted in 2005, which requires developers to consult with First Nations, may potentially help protect their federal treaty rights (Aboriginal Affairs and Northern Development, 2005).

The second reason is that few effective impact assessments concerning traditional land use and Aboriginal culture have been conducted to date. In Alberta, provincial legislation does not require a developer to undertake any form of historic resource impact assessment for the area under development, and it also does not require mitigation studies to avoid excessive impact on traditional lands and resources (Alberta Community Development, 1998 as cited in Natcher, 2001). Although some efforts are made to study and document traditional land use areas, current research methods fail to reflect the cultural and spiritual significance of the land, representing only the physical features of the landscape (Natcher, 2001). Further, even if assessment is carried out, decisions regarding how to collect information are left to the companies, which often leads to unsatisfactory results for the Aboriginals peoples (Ross, 2003).

The third reason is the asymmetries in the political power structure. Aboriginal peoples still do not have sufficient political power to fully participate in

decision-making regarding government and industry supported resource development activities on their lands (Stevenson, 1998). In many cases, furthermore, neither the Alberta government nor industry recognize or understand the values associated with traditional land use practices, which makes it more difficult to fully respect Aboriginal peoples' interests and to mitigate the impacts of resource development (MacKinnon, Apentiik, and Robinson, 2001). As a result, many Aboriginal communities claim that their concerns and opinions regarding traditional land use remain excluded from the final decision-making processes, and economic interests of both government and industry continue to be predominant (Natcher, 2001). Moreover, it is said that the political nature of the Government of Alberta is fairly conservative (Timoney and Lee, 2001), and they have been resistant to institutional reform (Davidson and MacKendrick, 2004), both of which contribute to maintenance of the existing political power structure. However, there are some positive movements such as the new consultation policy adopted by the Alberta Government in 2005 that may provide more political opportunities for the Aboriginal peoples in Alberta (Aboriginal Affairs and Northern Development, 2005).

3.3 The Role of Traditional Ecological Knowledge in Resource Management

Although TEK is drawing attention world-wide, many people view

conventional scientific knowledge as a more reliable source of information, because it is based on precise quantitative data, tests and experiments on large spatial scales, and it is considered logical and objective (Hull, Robertson, and Kendra, 2001). While science is based on abundant quantitative research findings and concrete data, local or traditional knowledge usually does not include quantitative data, and they appear to be more ambiguous and spiritual (Sherry and Myers, 2002). For many policy-makers who received university education and have worked in the state's environmental management systems, TEK may appear to be archaic and difficult to understand (Stevenson, 1998). For example, Denesoline First Nation people believe that if somebody hits a caribou, the caribou will migrate further because such behavior lacks respect toward the caribou; they also believe that steam rising from the falls during colder months tells them where they can find the caribou (Parlee, Manseau, and Lutsel K'e Dene First Nation, 2005). These types of traditional knowledge, which are built upon spiritual beliefs but not based on objective data, are found to be particularly difficult to respect and apply by non-Aboriginal people in the dominant resource management regimes (Stevenson, 1998). Moreover, policy makers often are skeptical of the validity of TEK because many Aboriginal peoples' lifestyles are becoming more and more assimilated into the modern culture (Sherry and Myers, 2002; Nadasdy, 1999).

Incorporating TEK into contemporary resource management may involve more difficulties. Some scholars are skeptical toward the use of TEK; they insist that in many cases, TEK tends to be taken out of its Aboriginal socio-cultural context and plugged into the dominant scientific framework during the decision-making process, and thus incorporation of TEK does not necessarily reflect Aboriginal peoples' traditional values and interests (Nadasdy, 1999; Stevenson, 1998). If we want to incorporate TEK effectively, fundamental changes in institutional-settings and paradigms might be necessary (Wiersum, 2000). Even if TEK is incorporated into the management decisions to some extent, it will eventually be largely influenced by dominant scientific knowledge, social values, and interests, since it is the scientists and resource managers who will be using the integrated knowledge (Nadasdy, 1999). Incorporation of TEK into dominant policy making processes is considered inappropriate since this process can result not only in a disruption of Aboriginal culture, but also can harm the environment by destroying traditional land management systems (Stevenson, 1998). The case study conducted with barren-ground caribou *(Rangifer tarandus),* for example, also indicated that TEK can be easily misused or misinterpreted if TEK is detached from socio-cultural values and contexts (Parlee, Manseau, and Lutsel K'e Dene First Nation, 2005).

On the other hand, an increasing number of scholars recognize the potentials

of TEK to contribute to contemporary resource management. TEK is considered as a valuable source of information because it is based on long-term and direct observation at a local scale, it allows us to detect subtle changes in the environment, and it can incorporate large sample sizes (Moller et al., 2004). Since many Aboriginal peoples have lived in a particular place for a long time, they often have detailed, location-specific knowledge, while science is based more on generalized theories and shorter research cycles, and often lacks site-specific information (Wiersum, 2000).

Some researchers suggest that complementary use of TEK by scientists might lead to improved prospects for sustainability, while either approach on its own cannot (Moller et al., 2004). TEK can help scientists to detect important environmental changes and to assist them in developing scientific hypotheses (Newman and Moller, 2004 as cited in Moller et al., 2004). For instance, while scientists still poorly understand the effects of global climate change in the arctic, the Inuvialuit's knowledge, which derives from long-term and site-specific observations and experiences, is expected to help scientists understand the changes in the arctic environment (Nichols et al., 2004). In fact, scientists have found that the Inuvialuit's knowledge concerning how the ice's distribution and thickness have been changing in the arctic is very useful for complementing western scientific knowledge (Nichols et al., 2004).

In addition, as TEK continuously evolves through experiential learning, it is also expected to play an important role in adaptive management, particularly when dealing with uncertain ecological changes (Moller et al., 2004). One example would be the monitoring efforts of barren-ground caribou (*Rangifer tarandus*) populations in the northern regions of Canada (Parlee, Manseau, and Lutsel K'e Dene First Nation, 2005). Studies indicate that TEK is capable of contributing to sustainable management of caribou populations through monitoring the changes in caribou movements year-to-year, and that the Aboriginal peoples have the capacity to learn and adapt their behaviors based on the observations (Berkes and Folke, 2002 as cited in Parlee, Manseau, and Lutsel K'e Dene First Nation, 2005).

Some researchers emphasize additional advantages of integrating TEK. It promotes participation of local communities, and it can be collected and utilized with lower cost compared to scientific data (Moller et al., 2004). Moreover, it is said that local people are much more likely to follow the resource management decisions being made when TEK is integrated into the processes of decision-making (Moller et al., 2004). Imposition of land management decisions made only by scientific knowledge (e.g. prohibit hunting of wildlife in a particular area) results in a failure in the long term unless there is a local support for conservation (International Institute for Environment and Development, 1994, Posey, 1996 as cited in Moller et al., 2004).

Conventional science must not replace local indigenous knowledge, but should be used as a complement (Roth, 2004). Greater success in cooperative management is most likely to be achieved when the non-Aboriginal sectors relinquish their control over decision-making processes, or when there is a sincere, long-term commitment by all parties (McGregor, 2002).

3.4 Concerns for Aboriginal Peoples' Health

An additional area of concern in regard to Aboriginal peoples' well-being that has only recently begun to receive attention is health. Interestingly, Aboriginal health is integrally related to land use practices. Because many Aboriginal peoples still tend to rely for their food source on wildlife, fish, and berries obtained through hunting, trapping, fishing, and gathering, their health conditions are very susceptible to local environmental changes. One study suggests that environmental contaminants such as organochlorines and heavy metals bioaccumulate in Arctic and sub-arctic wildlife, and that consequently the indigenous peoples in northern and Arctic Canada might have been consuming elevated levels of such contaminants (Berti et al., 1998). Another study that assessed the chemical contaminants contained in traditional diets of the Dene/Métis in the Western Northwest Territories, Canada, exposed the presence of 11 types of chemical contaminants (Berti et al., 1998). Others indicate that the level

of mercury concentration in the indigenous peoples' traditional food, particularly marine mammal meat, exceed the Canadian consumption guideline level, which could result in health problems such as diabetes and cardiovascular disease (Chan and Receveur, 2000). However, not enough research has been done to specify the sources of these contaminants, and to accurately predict the physical effects of such contaminants on Aboriginal peoples' health.

In addition to environmental contamination, scientists suggest that the shifting of diet from traditional food to non-traditional food, which may have been induced by the contamination of local food supplies or the decrease in access to traditional foods, may also have negative effects on Aboriginal peoples' health conditions. Literature indicates that traditional food obtained through hunting, trapping, fishing, and gathering provides the Aboriginal peoples with high animal protein, low fat, low carbohydrates, and adequate amounts of energy and micronutrients (Willows, 2005). Sea mammal fats (beluga, narwhal, seal, walrus) and organ meats (liver of both sea and land species), which are important traditional foods for indigenous peoples in the Canadian Arctic, are excellent sources of retinol (vitamin A), cholecalciferol (vitamin D), and α-tocopherol (vitamin E), and fish (char, cisco, lake trout, loche, sculpin, whitefish) provides rich sources of vitamin D (Kuhnlein et al., 2006). However, recently, traditional foods are increasingly being

replaced by non-traditional market foods, which appear to be low in iron, folacin, calcium, vitamin D, vitamin A, and fiber, but high in fat and sugar (Willows, 2005). Increased reliance on such non-traditional food might have led to a decline of Aboriginal peoples' health conditions. According to "Healthy Canadians: A Federal Report on Comparable Health Indicators", which is a recent report documented by Health Canada, Human Resources Development Canada, and Indian Northern Affairs, while 61% of all Canadians' health conditions are considered "very good" to "excellent", only 38% of First Nations are classified in the same category (Reading, 2003). The health conditions of Aboriginal peoples are generally worse than Canadians, and most health problems experienced by Aboriginal peoples are related to diet: anemia, dental caries, obesity, heart disease and diabetes (Willows, 2005). In particular, highly processed food such as Coca-Cola, fish and chips, fried foods, milk shakes, etc. have largely contributed to the epidemic of diabetes among Aboriginal peoples (Reading, 2003). Though physicians could not observe any diabetes when they conducted blood sugar tests among Aboriginal peoples before the 1940s, the incidence of diabetes is currently approaching epidemic numbers (Reading, 2003).

The majority of existing literature focuses on types of food Aboriginal peoples consume across different gender, age groups, communities, employment status, level of education, household size, occupation, and source of income (Willows,

2005). However, few have clarified the determinants that affect Aboriginal peoples' health conditions (Willows, 2005). In particular, very few studies have assessed the impacts of oil/gas development on Aboriginal people's health conditions. Considering the remarkable growth of the oil/gas industry in Canada and the number of Aboriginal peoples that might be affected by this development, more research is urgently needed.

3.5 The Need for More Research

While numerous researchers have conducted studies concerning traditional land use and TEK world-wide, there is still a large quantity of questions left unanswered. First, few studies have assessed Aboriginal people's perspectives toward the impacts of industrial resource development, since most environmental impact assessments are organized and implemented by the government and/or consulting companies, and are based on quantitative data collection. Despite the growing attention on Aboriginal rights and Aboriginal involvement, Aboriginal peoples' voices are rarely described in detail in impact assessment reports, and thus are not reflected enough in the current resource management regimes. It is extremely important for policy-makers and resource managers to understand Aboriginal peoples' perspectives in order to minimize conflicts and to build sound relationships. For this reason, research that can illustrate the Aboriginal perceptions, including their values and

beliefs, is necessary.

Second, the majority of existing literature concerning TEK focuses on the unique characteristics of TEK and how they differ from conventional science, or difficulties and potentials of integrating TEK into the dominant resource management regime. However, there are few studies that describe how rapid socio-economic and political changes in the society have affected TEK and traditional land use practices at local levels. In order to prevent TEK from being extinguished by various external pressures, more research is needed to clarify what factors in particular contribute to the disruption of traditional knowledge systems.

This study aims to partially fill these two gaps by providing a case study of the Alexis Nakota Sioux Nation, for which only one or two published studies are available. Thoroughly describing the perceptions of the traditional land users themselves would provide useful information for non-Aboriginal peoples to understand Aboriginal views and to avoid land use conflicts. In addition, we can examine how effective the current resource management policies are from an Aboriginal perspective, which may help us understand how to improve the ongoing policy and legal frameworks. Further, this study will provide a case study of how Alexis people's traditional knowledge systems are being affected under the industrial development practices and dominant land use policies. Doing so will help improve the

prospects for better ecosystem-management in Alberta, and the protection of the Aboriginal rights of this community to continue to pursue a traditional lifestyle.

4. Methodology

This project consisted of a qualitative case study, which entailed the collection and analysis of secondary information regarding the history of the Alexis people and local land use, field visits to the local community, and in-depth interviews with "key informants" including community elders and others who are or have been active in traditional land use.

In-depth interviews were conducted with eight traditional land users from the Alexis Nakota Sioux Nation's community, located approximately 1.5 hours' drive northwest of Edmonton, Alberta, Canada. Interviews took place in the Training Centre of the Alexis reserve in December 2005. Interviews were mainly led by myself, while Dr. Tanja Schramm, the History Project Coordinator and former Land Consultation Office Coordinator of the Alexis Nakota Sioux Nation, helped facilitate the conversations and occasionally asked additional questions. Having multiple researchers rather than a single researcher helped produce a more complete and a more objective picture of reality. Dr. Schramm also acted as "gatekeeper", helping me develop a positive relationship with the Alexis Band members before the interviews began, and introducing me to appropriate people who can speak for the community and support my research.

A researcher has to decide to what extent he/she would like to be involved

with the subject group when entering a field (Neuman, 2003). It is said that the role of field researchers can vary on a continuum ranging from a complete outsider to a complete insider (Neuman, 2003). Adler and Adler (1987) as cited in Neuman (2003) suggested three roles of field researchers. "Peripheral membership" refers to the role of an outsider, who maintains a certain distance between him/herself and the people being studied, and separates researcher's values and beliefs from the observed people's values and beliefs (Neuman, 2003). "Active membership" refers to researchers who become members of the group and participate in activities with the people being studied, but who are still not completely immersed in the group (Neuman, 2003). "Complete membership" refers to the role of an insider, when the researcher "goes native" as a fully committed member, and experiences and shares the same emotions as the subject members (Neuman, 2003). In this case, a researcher lets the subject people see him/her only as a participant, and not as a researcher. It is difficult to say what level of involvement is the best (Neuman, 2003). Some people criticize that complete membership may lead to a loss of a researcher's perspective, while others argue that complete membership is the only way to really understand a member's social world (Neuman, 2003). However, there are no clear guidelines for making a decision, and researchers have to rely on their own judgment depending on the situation (Babbie and Benaquisto, 2002). In this study, my position would be

categorized as a "peripheral member", since I did not have opportunities to participate in traditional activities with the Alexis people, and I only stayed in the Alexis community as a researcher for a short period of time. Dr. Schramm's role, on the other hand, can be described as an "active member", since she is not only an acquaintance of the participants, but also continues to maintain a perspective as a professional researcher. Thus, we have put ourselves in a position that relatively emphasizes a researcher's perspective, while still maintaining a certain level of close relationships with the participants.

The interviews were guided by the following questions: 1. How has the surrounding environment changed over time in response to industrial resource development activities (i.e. oil/gas development and forestry)? 2. How have such activities and their impacts influenced your traditional land use practices (i.e. hunting, trapping, fishing, and gathering)? 3. What particular types of industrial resource development activities have caused the impacts on different traditional land use practices that you have mentioned? 4. What do you think will happen to your traditional knowledge systems over time if these impacts are to continue? 5. What does it mean for your community if TEK is lost? 6. How do you think Alexis, government and industry can resolve land use conflicts?

Before starting the interviews, each prospective interviewee read an

information sheet, and I obtained informed consent by explaining the objectives of this research, types of questions I will ask, expected length of interview, use of collected data, level of confidentiality, ownership of data, etc., and interviews began after each interviewee agreed to participate in this research. This research obtained an official approval from the Faculty of Agriculture, Forestry and Home Economics' Human Research Ethics Board at the University of Alberta, and followed all the ethical guidelines for research involving human subjects mandated by the body, as well as any additional requirements requested by the Alexis Band. The interviews were not designed to be confidential, and the data will be held by the Alexis History Project for the benefit of the community. The length of the interviews varied from approximately 40 minutes to 90 minutes depending on the interviewee.

Interviews followed a semi-standardized format. In a semi-standardized interview, interviewers basically ask predetermined questions to the interviewees, but interviewers may not completely follow the prepared questions in order to be flexible enough to adjust to different occasions (Berg, 1998). In other words, interviewers are to ask both scheduled and unscheduled questions so that researchers can obtain the most from the interviews. Following this interview style, I frequently modified or added more questions depending on each interviewee's reactions. Though I often tried to facilitate the interviewees to talk about the main points I wanted to ask, I did not

force interviewees to respond if they seemed to be uninterested in or unwilling to answer certain questions, but rather let the interviewees talk about whatever they thought was important. As a result, some interviewees referred to subjects that I did not expect to hear before conducting the interviews (e.g. impacts of land use regulations, concerns for health, etc.).

The interviewees were selected so that they can represent the traditional land users of the Alexis community as accurately as possible. In this research, Dr. Schramm, who has in-depth knowledge of this community, selected the appropriate interviewees who are traditional land use experts, and who can represent the community adequately. The population of the Alexis Nakota Sioux Nation is sufficiently small that Dr. Schramm is familiar with most of the traditional land users, which makes it possible for her to choose suitable representatives. The selected interviewees were: Helen Letendre (female elder / age: late 70s / gatherer), Henry Bearhead (male elder / age: 70s / hunter and trapper), Ben Alexis (male elder / age: 60s-70s / hunter and trapper), Angela Jones (female elder / age: 60s / trapper and gatherer), Sylvester Mustus (male elder / age: late 50s / hunter and trapper), Daisy Potts (female / age: late 40s / expert in making dry meat), Darwin Alexis (male / age: 40s / elected councilor), Vernon Jones (male / age: 40s / hunter and trapper, elected councilor). Thus, I interviewed five males and three females, five older (i.e. over 55)

people and three younger (i.e. 40s) band members. While all of the selected interviewees were traditional land users, they varied in terms of gender and age, which helped us hear of different experiences and perceptions. For example, male interviewees tended to talk more about hunting/trapping animals, whereas female interviewees mentioned more about gathering berries and medicinal plants. Older representatives, who are eligible to be regarded as elders, appeared to be more spiritual and deeply embedded in their traditional culture compared to the younger representatives.

All the interviews were taped by an audio-recorder and a video camera, except for one participant, who declined to be videotaped. Field notes were also taken during the interviews. Since Henry Bearhead was not very comfortable communicating in English, the interview with Henry was conducted with Darwin Alexis, who helped translate Henry's Stoney language into English, and my English into the Stoney language. Darwin also participated in the interview as one of the interviewees. All the other interviews were conducted in English, with the presence of one Alexis representative, Dr. Schramm, and myself.

The entire set of interviews was transcribed in order to be analyzed in detail. Not only the interviewees' responses, but also the interviewer's questions and reactions were recorded, transcribed and analyzed. Field notes were taken throughout

the interviews and were also used for analysis. In the quotes presented in Chapter 5., Research Findings, the words "um" and "ah" were removed from the transcripts because it might be distracting for the readers. "…", standing for an omission of a few words or sentences, were inserted when there were words that appeared to be repetitive or redundant in the context. "[ ]" was inserted with a word or explanation inside, when some important information was not mentioned by the interviewee, but was useful for the reader to understand the context. In addition, minor grammatical errors were occasionally corrected if it seemed to be distracting for the readers (e.g. "wanna" was corrected into "want to"). The transcribed scripts of interviews were categorized into the following themes:

1) Impacts on hunting and trapping wildlife

2) Impacts on gathering berries and medicinal plants

3) Impacts on drinking water and fishing

4) Impacts on transmitting traditional ecological knowledge

5) Lack of notification and consultation

There are several weaknesses in this type of method. First, data could be largely affected by both researchers' and interviewees' subjective values, beliefs,

skills, disciplines, insights, awareness, etc., and thus it generally lacks reliability, particularly when it is collected by a single researcher (Babbie and Benaquisto, 2002; Neuman, 2003). However, having my description of research findings and data analysis reviewed by Dr. Schramm and having her support during the interviews helped ensure that I engaged in this study with a broader perspective than might have been possible were I on my own. Second, the data is not suitable for statistical analysis and generalization, because the interviewed individuals are not selected through random-sampling (Babbie and Benaquisto, 2002). Since this study focused on a particular group of people (i.e. traditional land users of the Alexis community), the findings would lack representativeness and cannot be generalized to all the Aboriginal peoples in Alberta or Canada. Nevertheless, a strong focus on a particular group of people can also be regarded as one of the strengths of this study. Data based on traditional land use experts' direct and long-term observations would provide us with detailed and site-specific information that cannot be collected by a statistical approach.

There are certain strengths in this method as well. One of the major strengths of in-depth interviewing is high validity (Babbie and Benaquisto, 2002). By going directly into the community and having personal, in-depth, long interviews enabled us to develop a deeper, fuller, and comprehensive understanding of the interviewees'

perspectives, including the Alexis people's emotional feelings, detailed perceptions, and the traditional values and beliefs that underlie their attitudes. The primary objective of this research is not to conduct a scientific impact assessment by presenting numerical data, but to explore the Alexis people's perceptions of impacts. In other words, our aim is to study how traditional land users of the Alexis community "think" or "feel" about the effects of industrial resource development on their traditional land use practices. This type of ethnographic, narrative-based research is also important because it helps us understand the subtle nuances in their distinct views, which cannot be described by statistical numbers (Babbie and Benaquisto, 2002). Policy makers and resource managers have to understand such subtle nuances of Aboriginal perspectives in order to build sound relationships with First Nations.

Another strength of this study is that all the interviewees are active and well-experienced traditional land users who have been hunting, trapping, and gathering for many years at a particular area. For example, according to Dr. Schramm, Henry Bearhead has been engaged in hunting and trapping for most of this life, Helen Letendre has spent much of her lifetime gathering herbs and berries and is respected as an expert on history that connects people to their traditional lands, Sylvester Mustus is recognized in the Alexis community as a traditional knowledge and skills expert, Darwin Alexis was raised in a very traditional family that maintains its strong

ties with the land, Daisy Potts is a very active traditional land user and is well-known for her skills in making dry meat, and Vernon Jones has an experience of working as a land monitor for Alexis. Collectively they have been observing systematically changes in the surrounding environment for many decades, which makes them capable of detecting and describing the subtle changes of the environment in the region. In-depth interviews with such traditional land use experts have provided us with abundant site-specific information based on long-term observations.

In addition, field interview-based research is flexible (Babbie and Benaquisto, 2002). This type of study allows a researcher not to follow fixed steps, but to modify research designs at any time (Babbie and Benaquisto, 2002). In fact, I frequently modified my questions during the interviews depending on each interviewee's responses, and I could also adjust the processes of data analysis (e.g. developing themes) as my interviews and data analyses proceeded. Finally, the selected interviewees were diverse. Involving both old and young, males and females, hunters, trappers, gatherers, and councilors certainly enhanced the breadth of data, representing a variety of voices in the community.

5. Research Findings

In this chapter, I provide a detailed description of what I have found through the interviews with eight traditional land users of the Alexis Nakota Sioux Nation. It is important to note that this research only focuses on exploring the perspectives of the Aboriginal land users from a qualitative approach, and it does not attempt to measure the environmental impacts of industrial resource development (oil/gas development, forestry, cattle ranching) in a quantitative manner. In other words, the primary objective of this research is to illustrate how Alexis people think and feel about industrial resource development practices occurring in and around the reserve. The research findings are categorized into five parts: impacts on hunting and trapping wildlife, impacts on gathering berries and medicinal plants, impacts on drinking water and fishing, impacts on transmitting traditional ecological knowledge, and lack of notification and consultation. Each section is further classified into three or four subcategories, so that the reasons and processes of how the impacts occur will be clarified.

5.1 Impacts on Hunting and Trapping Wildlife

5.1.1 Declining Wildlife Populations

Interviews revealed that the Alexis people are not able to practice traditional

hunting and trapping as they had in the past due to a variety of reasons. The first reason is the decline of wildlife populations. All of the eight traditional land use experts indicated that there is a decline in wildlife populations that may be due to industrial development, and that they are more or less losing opportunities for hunting and trapping. They relate the decrease of wildlife populations to industrial resource development activities, particularly logging and oil/gas development, which have increased considerably since the 1990s. Wildlife species that were mentioned by the participants include: rabbits, squirrels, beavers, muskrats, martens, mink, wolves, lynx, deer, elk, moose, ducks, and prairie chickens. While some participants said that deer is still abundant, they generally feel that other wildlife have largely declined in population. In particular, beavers, muskrats, elk and moose were mentioned by many traditional land users since they are significant sources of food and pelt in their traditional economy.

A well-experienced hunter/trapper, Sylvester Mustus, mentioned that he cannot hunt or trap where he used to because wildlife such as mink, wolves, elk, and moose have drastically reduced their populations. He said that clear-cutting practices conducted by forestry companies are destroying wildlife habitat. Sylvester described his observations as follows.

S: ...wildlife has drastically declined ...where I was out there ...there was abundance

> of elk, when I was there 15 years ago. Today, we cannot even find one elk there. The elk, they moved further west. And I had a lot of mink, …wolf, other big animals in certain area, …when they start clear-cutting it, they kill all the habitat off, and all those big animals move south, I don't see any tracks, any of it, any more. And all the moose moved out because they cut all the trees down, cut all the food down …And the only thing that's around there abundant is white-tailed deer. In that area where I used to hunt. Now I don't see any of the bigger animals.

Vernon Jones also mentioned that wildlife populations were largely reduced after forestry companies conducted clear-cutting practices, and that Alexis people have been deprived of their hunting and trapping opportunities. He talked about his experience of observing water drying up, hibernating spots being destroyed, and beavers' food sources being lost after logging practices took place. In particular, as beaver meat and beaver pelt play an important role in their traditional culture, he says that the decline of beaver populations is a huge obstacle in pursuing their traditional lifestyles. In addition, Ben Alexis also mentioned that his trapping opportunities are being infringed because of clear-cutting. According to his observation, lynx and squirrels have decreased after clear-cutting practices took place, maybe due to habitat loss.

One of the Alexis Band's political leaders, Darwin Alexis, explained that forestry companies used to work with Alexis people in the past, and that they mostly applied selective-logging practices that leave some trees behind, rather than clear-cutting. However, along with the technical improvements, they stopped hiring

the Alexis people and started to clear-cut everything by using large machines. Darwin Alexis and Henry Bearhead mentioned that this type of technological improvement also accelerated the destruction of wildlife habitat and reduced hunting and trapping opportunities. Henry and Darwin described this as follows.

> HB: But now, a big machine goes there and cuts everything. There's nothing. When the sun comes out, oh you really feel it, then there's nothing there to hold that, you know. That's another thing. A lot of people they don't think about that, they think about the money.
> DA: I guess selective logging and clear-cut, right? Before we used to selective logging, they leave some trees, but now they take everything, ten inch, or eight inch ones, too.
> HB: ...chances are all the trees are gone and there's no squirrels and marten, lynx, what are we gonna trap? We can't trap, what do you call them, mice.

While some elders observed a decline in wildlife population after clear-cutting of forests, others referred to environmental contamination caused by oil drilling as a reason for decreasing wildlife. Sylvester Mustus described his experience of observing dead beavers in the water that was polluted by oil. He was saying that his opportunity for trapping beavers has been reduced because of oil development. He described his observation as follows.

> S: Oh last spring, we were walking around there, in my trap line, and all the abundant beaver dam, and beaver house, beaver lodges there, and in that bog before, in that spring we didn't see and sites around, there was a few dead beavers in the water. And the water wasn't that good. There was some oil on top of the water... In the spring time there's a lot of contamination. It must have killed some of the beavers...
> Run-off in the spring. ...there's lots of oil-leak from the pump-jacks you know,

they're stationary. Pump-jack that go up and down. They pump the oil out… And then in the spring time they just run off the river. And then at the beaver dam they dam it up, so it stops there, get the beavers, [and they] inhale that. And then they eventually, gradually they just die out. So now I have to look somewhere else to get my beavers, I want to get beaver pelts you know, on my trap line.

Furthermore, Angela Jones mentioned that not only mammals, but also birds are decreasing, which further deprives of their opportunities for hunting. Birds such as ducks and prairie chickens are important food sources for the Alexis people, but their populations have also declined according to her observation. Angela mentioned:

A: Now, a lot of birds never come back this summer. Yes, a lot of them didn't come back. I don't know they're dead or what, I don't know what happened to them. Every summer we can see birds, all kinds of birds. Now there's not very many of them came out… the ducks, they don't come around here.

5.1.2 Wildlife Getting Sick and Unhealthy

The second reason for having less opportunity to hunt and trap is that wildlife is becoming sick and unhealthy. Alexis traditional land users were feeling that many wildlife species that used to be healthy before started to look unhealthy due to expanding industrial resource development activities. They think that drinking polluted water or eating polluted leaves have negatively affected the wildlife's health conditions. Because the wildlife does not look healthy, many Alexis Band members are no longer willing to hunt/trap and eat animals as they did in the past. Wildlife mentioned by Alexis traditional land users include rabbits, beavers, muskrats, weasel,

cougars, deer, elk, moose, ducks, and prairie chickens, and Angela Jones expressed her concerns for not having enough food to eat in the nearer future. She was feeling anxiety because the government keeps on telling them that more and more animals such as moose, deer, elk, and birds are getting sick and polluted. Ben Alexis also indicated that the animals are sick due to polluted water. He mentioned that people's lives were dependent on beavers, rabbits, and muskrats a long time ago, but they are losing those important livelihoods because of heavy pollution caused by industrial development. Ben described his ideas as follows.

> B: ...we can't hunt too much there any more ...what we used to depend on are getting sick... Like beavers, rabbits, we live on those. And muskrats. But in those days a long time ago, when we eat such animal, (unclear) sort of help you and you benefit from them, now you can't. The water is polluted... When the water is polluted, then the animals, they're sick as well... When the water is polluted it makes the animals sick.

Daisy Potts said that she does not want to hunt or trap wildlife that is skinny, or has some kind of disease. She gave an example of a moose that had a disease and had worms all over the inside of its body. She mentioned that herbicides and water pollution make them sick. Fear toward having polluted meat further reduces the peoples' opportunities for hunting/trapping. Daisy expressed her concerns as follows.

> DP: ...moose, deer, beavers, elk, ducks, chickens, muskrats, rabbit, all the animals that we eat, are affected by the water, by the pollution. You know, by the leaves that they might eat, from being sprayed, by chemicals that they use when they spill

around their digging areas. There was this moose, the moose are sick, they're getting sick too, because of what's happening out there. There was this one moose, that this person, I didn't, it's a relative of mine, shot this one moose, and that moose was all full of worms. Big worms. That's what it's doing to our animals and, they get some kind of disease from it... I've noticed... they're not as healthy as before, like a lot of our duck, fish, and the moose that were killed are just skinny, and now they just look really unhealthy. There's not enough meat. So we don't bother those... it's pretty scary to even kill them, because we don't know what they've been eating around there and then you know the area is polluted.

Furthermore, Henry Bearhead and Darwin Alexis mentioned that their health condition is declining because they have less wildlife meat available compared to the past. Now they have to depend on non-traditional processed food rather than traditional food because they do not have enough healthy wildlife to hunt or trap. They stressed that the increasing reliance on processed food is negatively affecting their health conditions because their bodies are not accustomed to non-traditional food. Henry Bearhead and Darwin Alexis expressed their ideas as follows:

HB: ... on their [white people's] food ...we get sick. We get cancer, children diabetes, there was no such a bad thing back in the years.
DA: ...but nowadays we can't ...hunt and gather as we used to, so we are dependent on beef and pork and that's how we're getting sick with processed foods.

5.1.3 Restrictions on Land Use

The third obstacle when hunting and trapping is the restrictions concerning land use enforced by the government. Under the current land management system in Canada, most of the land and resources are owned by the provincial government, and

the province grants licenses to oil, gas, and forestry companies as well as ranching leases to individuals and gives permission to develop the land. Although both the federal and the provincial government's policy recognizes the Aboriginal peoples' right to pursue traditional land use activities, the Alexis traditional land users consistently claimed that their rights have been restricted in many ways. Participants insisted that because the government continues to give licenses and permissions to the companies who do not care about traditional land users' rights, a lot of their traditional hunting and trapping sites have been destroyed and their activities are significantly restricted. The more licenses are given to oil, gas, and forestry companies, the less opportunity the Alexis people have for hunting or trapping. Daisy Potts mentioned that it is becoming more and more difficult for the Alexis people to camp because the oil and gas companies continuously build fences, construct oil and gas wells, dig up the land, build pipelines, etc. She also talked about numerous signs that prohibit hunting or even entering an area. Angela Jones also mentioned a similar point. Daisy explained the situation as follows.

> DP: ...it's affected us very badly. You know we can't camp where we normally camp because there's oil wells there now ...where we know there's a lot of game is where we make our camp, where there's good water is where we make our camp. Because of all of this digging up of the lands, and the oil rig is going in and making, building pipelines and setting gas wells, we can't go where our original camping spots are... for making our lives like in the traditional way, and that's all ruined and... all these ...springs where we used to camp by, is taken from, and it's fenced off and we have

no access to it...There's a lot of legal restrictions out there by oil and gas companies. Where we normally go, and do whatever we want to do, ...it says "Do not enter.", "Private property.", "No hunting", "Danger", all kinds of signs like that.

Alexis Band members were feeling that they are frequently being expelled by government officers when they go out on the land. The industry workers do not want them to hunt or trap at a place where they are planning to conduct some development activities. The government officers also impose time limits and restrict the individuals who can use trap lines, which they have never experienced in the old days, the Alexis traditional land users always feel oppressed when they go out hunting or trapping. Sylvester Mustus expressed his frustration toward the industry workers and the government officers who always keep the Alexis people under observation and ask them to leave the land, although it is a traditional site where they used to hunt or trap.

S: Because I'm a trapper, too. And these last three years, I had so much restriction put on me there, I don't even want to go over there. I've been trapping for the last two years, there's so much development going on there, I'm questioned all the time... And they tell me that this certain area here, it's going to be developed. "We want you out of there at the certain time." They give me a time limit. Nobody gave me, our people a time limit! They stayed there all they want. You know, if you want to take a family member down to our trap line, they have to be registered by the government, as a trapping partner to have accessibility to that land. And they can't stay for more than two weeks, you know. You know the rules are getting stricter... we could only have a temporary access, like the longest that we can stay is two weeks... At one time, we used to live on this land year round, You know, summer, winter you know, we used to stay all out there, they never gave us any restriction... We can't use the traditional land as a hunting resource... so how can we enjoy the land, our livelihood? If all these restrictions are put on our people?... And these people I'm talking about, will report to the authorities, to the higher authorities so

they can get rid of us, so they come out there, and they, officers or somebody, whoever applies to that land, will come out there, and... try to get us go home. If we are in a municipal land, RCMP is going to come out. In a crown land or in an area where logging is going on, forestry official will come out there and tell us this, if we are in a trap line or a hunting area, Fish and Wildlife will come out there and they will say you know, this is enough, you have to go home. Where was our home? Our home is our land! Where are we going to go home to? This is our, our whole Canada is our home. So more or less, people who migrated in this land, are making rules for people who never left this country.

A lot of trap-lines that have been handed down from generation to generation by Alexis Band members have been fenced off for cattle grazing leases. When they fence the land for grazing, the Alexis people cannot even enter their own registered trap-lines, and wildlife species that used to inhabit this area cannot enter it any more due to the barriers. If the Alexis people try to enter the area and hunt, they will be considered trespassing. The increasing numbers of fences, gates, and trespassing signs make it difficult for them to hunt or trap on their traditional lands. Ben Alexis described this point as follows.

B: ...my trap line, my dad's trap line is the only one where we hunt you know, I guess, lot of it is grazing land, farmlands now. So sort of it makes trapping difficult. There's certain grounds that we used to go in there year after year. But that's been fenced off by the grazing leases. This is what it makes it kind of hard for us. We can't go hunt there any more, because we can't even go close ...when we're going right into the trap-line and the hunting ground... So it's really kind of tough. But ever since I can remember when we lived out there for years and years...I told you the moose and the deer, ...and the elk, they're not even around any more! Because too many roads! And then most of the areas turned into grazing leases. And then wherever there is a grazing lease right away, you know, the trespassing sign goes up. And it's kind of hard for us to hunt around there.

Road-blocks built by oil and forestry companies are another huge obstacle when the Alexis people want to go hunting or trapping. Henry Bearhead referred to the increasing number of oil-well access roads that do not let them go through. He pointed out that the situation became worse when oil companies started to move into the area, and that the situation is getting even worse these days. He expressed his frustrations for not being able to enter his registered trap-line because of the oil-well roads. Sylvester Mustus talked about the logging companies that often block the roads and occupy the area with various equipments. Because of numerous road-blocks, there are many cases when Alexis Band members cannot even enter their traditional hunting/trapping grounds. Henry expressed his concerns as follows.

> HB: ... back in 1990, that's when it was the worst part, we can't even go hunting, ...all (unclear) in our trap line, they make a road and they didn't allow us to go through it. That's our trap line, we can go use that road, but who told to make that road? That's one thing that is real you know, bothers our people as especially a trapper you know. You go up there for something else, and a road block, we can't go through it...We moved around, we stayed up there all summer, we used pack horses, all those things are roads, just oil roads.

The government requires the Alexis people to obtain a license when trapping on the land, and they now need to pass a test in order to become a licensed trapper. Individual ownership of lands and resources is not part of the traditional culture of the Alexis people; the licensing process of the government is therefore antithetical to customary laws. Because they are afraid of being questioned on the land by the

government officers, many of them prefer not to go out for hunting or trapping. Since various regulations made by the government do not easily fit in the Aboriginal culture where everybody share the resources, their rights for hunting and trapping are further being restricted. Darwin Alexis explained as follows.

> DA: Then the 90s there was the Gun registry, then they put some policies in place for trapper's use, trap-line and cabins, and ...what I see of elders nowadays is that, they respect the law, so they don't want to break any laws and they are afraid to go out there and hunt and stay as they wish. So policy has affected them greatly, everybody greatly. Because you need to have a license to have a gun out there, ...you need to be... a licensed hunter, you need to go to a training, to get a certificate, so that you can be on the land.

5.1.4 Cabins being Burnt Down

The fourth reason for having less opportunity to hunt or trap is that their cabins are being burnt down without any notification or consultation. Cabins are important strongholds for hunting and trapping activities and are built by the Alexis people themselves. Some Alexis interviewees mentioned that the non-Aboriginal people intentionally burn the cabins down in order to erase the evidence of Aboriginal land users' existence, and to make it easier to obtain a license from the government. Henry Bearhead described his observation as follows:

> HB: Somebody must have burnt it... we went out there and helped them build a cabin. And we stayed, after finished a cabin, we stayed over night. And that's the only night that we slept in. And we went up back there, the following week, like we went we came back there, at Monday, and we went back, we went back up there, a couple

> days of time, no more cabin. All the traps are burning. Whatever he had in that cabin, they were all burned... That time there was about five cabins were burnt. Or six.

Ben Alexis and Darwin Alexis also revealed that they had their cabins burnt down. Ben Alexis had 4 of his and his father's cabin burnt down. Darwin Alexis had his cabin burnt when he and his family was away for about a week before Christmas.

5.2 Impacts on Gathering Berries and Medicinal Plants

5.2.1 Spraying of Herbicides or Pesticides

Many Alexis traditional land users mentioned that spraying of chemicals (i.e. herbicide or pesticide) conducted by forestry companies has a significant impact on berries and medicinal plants. It has largely reduced the quality and abundance of berries and plants in areas that were traditionally important to the Alexis people. Darwin Alexis referred to the provincial forestry standard that requires foresters to free the seedlings from surrounding vegetation so that they can grow to a certain height in a certain period, and he said that this standard promotes the use of herbicides, which kills many berries and medicinal plants. According to Helen Letendre's observation, a big blueberry patch where she always used to pick berries in the old days has disappeared. Though she is not exactly sure, she said that she and some other Alexis Band members think that spraying of chemicals might be the reason. Daisy Potts also mentioned that it is becoming more and more difficult to find berries, and

that she is afraid of gathering them because they could be polluted by spraying of chemicals. She expressed her concerns as follows.

> DP: Forestry ...is doing a lot of cutting. Tree cutting. Making our forest, bare, damaging a lot of our berries, can't find berries out there to make you know, we rely on the animals, berries and our medicines. Because we rely on as native people and they're damaging our berries, our medicines, there's nothing out there any more. Berries, sometimes berries can't be used, because it could be polluted with what they're using, spraying and, forestry does a lot of spraying, when they go out there to, I don't know what kind of, what it is, but bug spray or whatever they use, what kind of spray they use, they damage a lot of our berry trees. We can't grow any more and can find nothing. I didn't even pick one berry this summer. I could find nothing.

Helen Letendre also mentioned that she cannot pick berries and medicinal plants nearby the roads because she is afraid that those plants might be sprayed. She talked about her experience when she told her children not to pick berries in areas near the roads. They have to look for berries and herbs further inside the forest in order to avoid gathering sprayed berries and medicinal plants.

5.2.2 Excessive Disturbance by Oil Development

The land disturbance that occurs when building oil wells also largely reduces berries and medicinal plants. Oil companies clear, dig up, and plow the land, build oil wells, and construct roads to gain access. Daisy Potts and Angela Jones pointed out that this process kills the roots and dries the soil up, and it eventually kills berries and medicinal plants. Daisy Potts described her experience as follows. She could not find

any berries and medicinal plants where she used to go gathering, after the land was disturbed by an oil company.

> DP: ...there's places where we know of like, back in the years that, there's places where there's medicine growing, like you know, there's really good, a lot of medicine there we can pick, like rat-root and other kinds of different kinds of medicine. But now, if we go back there sometimes we don't find it. Sometimes it's dug up. It's just plowed, like made into roads, and it's graded, made into a field of dirt, so that the oil wells can sit on top of that instead of ...medicines are growing, and we can't pick, we can't take the medicines from there. There's nothing there. They wipe it out. Sometimes we go a place where we know there's a lot of berries, raspberries, saskatoons, chokecherries, and it's the same thing we find, it's all gone. So that's how it's affected, that's how we lose that part when ...we have to ...go elsewhere. ...even when we go elsewhere we don't find anything. ...a certain berry picking and medicine picking area, it's gone. It's damaged.

5.2.3 Cattle Grazing

Cattle grazing is another huge obstacle for the Alexis Band members seeking to gather berries and medicinal plants. Darwin Alexis explained that after clear-cutting the forest, the ranchers come in and fence out the area, and then they bring in cattle to let them graze on the land. Once the land is cleared and leased for cattle grazing, the whole area will be fenced, and a large number of cattle will trample on the plants, which eventually kills off most of the berries and plants.

Ben Alexis referred to a big blueberry patch that turned into a grazing pasture. Although it was an important site for gathering blueberries, now the blueberries all disappeared since cattle came in. Trampling by cattle seems to have a significant

impact on berries and many other plants. Ben described this point as follows.

> B: Well, berries I guess, most of the berries like I said that the big blueberry patch we had, this turned into a grazing lease. It's turning to grazing lease and there's no berries left, there's cattle there but there's no berries. It looks like they burned the cabin up there now the leases have burned the cabin down. But now they lease that land now ...we can't pick berries there any more because there's this cattle, there's no berries left... But I think there is a lot of damage done to certain herbs that needed people use out there. I think they should have been preserved.

Moreover, restrictions on gathering medicinal plants caused by a variety of reasons might have an impact on Alexis people's health condition and life expectancy, according to some of the traditional land users. Sylvester Mustus pointed out that the Alexis Band members' life expectancy is becoming shorter compared to the past, when they could gather medicines wherever he wanted to, share information with others, and helped one another in the community. He insists that modern medicines are not suitable for their bodies, and that they have to take certain amounts of traditional medicines in order to maintain their health conditions. He insisted that various restrictions imposed by the government officials are one of the major causes for the shortening of Alexis Band members' life expectancy. Sylvester described this point as follows:

> S: Sometimes we use it and live longer than using a modern medicine. Some of our people used to live a long time, about 50 or 60 years ago, they used to live over 100 years. At least, in average of 90-80 anyway. But today with modern medicines, they're dying off at 40s you know. We don't have very many people who are over 50

> in this reserve. So, you know, we're trying to... rediscover what might people had 100 years ago so that we can live longer. And how can we practice that when government official put the restriction on, they want to know, how much is coming out on the land when we go there, you know. At one time, my people were allowed to go and get the herbs wherever they wanted to. They weren't stopped or asked questions. And that's how, that's the reason why they had a healthier lifestyle. They were able to share with... their own people what they gather and help each other out. But how can we practice that when the access to this is stopped, it's stopping the connection in my community. One people trying to help another and it is stopped by a third party, you know.

5.3 Impacts on Drinking Water and Fishing

5.3.1 Pollution

In the old days, the Alexis people drank water directly from lakes, rivers, creeks and springs. Some sacred springs often played significant roles in their traditional culture. However, they are losing their access to safe drinking water due to water pollution caused by oil and gas development. Although they are not certain to what extent the water is polluted, they are told by government officers not to drink lake water because the water is polluted. Needless to say, Alexis people do not want to drink the water that might be polluted, and thus now they drink tap water. Anxiety towards drinking polluted water again deprives them of their rights to follow traditional lifestyles. Angela Jones said that she feels very sorry that clear water has disappeared. She pointed out that the water has been polluted since many non-Aboriginal people came in to live nearby the lake Lac Ste. Anne, and since oil and gas developments started to take place. Further, she pointed out that loss of access

to clear water also reduces opportunities for traditional camping because they go camping in areas with abundant drinking water. Angela expressed her frustration as follows.

> A: Oh, this lake you know, we [were] raised from it, we drink this lake water, there was not very many people living around the lake. This clear water we used to drink from it and now there's a lot of people coming to live by the lake. I don't know if it's good to drink it again because the person who has come here one time he said our lake is polluted, I don't know. So we never drink from it. Then we drink water like a pump, hand pump water, we drink that. Now they make houses and we drink out of a tap. (laugh) And the gas company told us not to drink the water, the tap. I don't know which gas mixes with it so we never drink the water. We have to haul water from other place. We're drinking, they spoiled the water! The gas/oil companies spoiled the water or the people living around it spoiled the water, too... I feel so sorry for the water that's gone. We camp, you know, at any places with water and we drink from it. But now we can't do that. Everything is so polluted.

5.3.2 Lakes and Springs Drying Up

Another reason that restricts them from drinking water is that springs and lakes are drying up. Sylvester Mustus has directly observed three springs that existed near his cabin drying up right after the oil companies started drilling on the surrounding grounds. He is seriously concerned that they will not be able to gain access to safe drinking water in the near future. He also mentioned that they will have to carry water from their houses when going out to their traditional hunting/trapping grounds, which they never did in the old days. Sylvester Mustus described his observation as follows.

S: I've been trapping in there in the last 15 years and I have seen a great change on the land like at one time, not far from where my cabin is, there was three springs. But they started drilling on the ground and all the springs are gone. There's no drinking water, so the number one is overdevelopment is going on. There's gonna be no drinking water left for miles. People wanna go out for the traditional land, they're gonna have to carry water from here. Safe water. So water is gonna be very important for one thing.

Helen Letendre, as well as her daughter, observed some lakes where the water level is becoming lower and lower after oil wells were built around the lakes. She also mentioned that every creek she saw recently was polluted by oil to some extent, and that they cannot obtain water from the creeks where they used to when going out for camping in Cynthia. Helen Letendre said:

> HL: Well, you know our lakes ...the shore of the lake is getting just like the water is drying out. And maybe, it's because of the oil wells around them. ... Yeah, even where my daughter, she lived near the lake that they have, it's drying out. So I wonder why it's like that, because they used to trap some...muskrat in that lake... Yeah, especially now, when the water like I said you know, every creek, there's oil, but that water that's where they always come in even though we camp in Cynthia, or further than that, they always get their water there, now they can't. They can't get the water. That belongs to the Indians long time ago. Spiritual, like you know, it came from the ground, and they believed that God give them, the spring, forever. But I don't know what's happening.

5.3.3 Water being Sold from a Sacred Spring

Another factor that restricts their usage of water is business. One company called "Voda Springs" built a house over a sacred spring near Lobol Lake, where Alexis people used to stop by on the way to Cynthia and Lodgepole to get water, and the company started to sell bottled water from the spring. Helen Letendre pointed out

that the company built fences and set up signs around two springs in that area, which made it impossible for Alexis people to gain access to the water from the springs. Sylvester Mustus also talked about the spring, and he mentioned that the company is selling water bottles to the United States. Since it was a sacred spring used as one of the Alexis Band members' important camp sites, they appear to be very upset about this case.

5.3.4 Signs and Regulations

Signs that prohibit fishing along many lakes and rivers restrict Alexis people's opportunities for fishing. Daisy Potts talked about a sign put up at a lake where Alexis people traditionally caught plenty of fish by setting up fish nets. The sign indicated not to fish at the lake, and she assumes that it is because the water and fish are polluted just as they are in many other lakes.

> DP: There's even a note chain, there's even a sign, this past summer saying that Utumzatum Lake, you know where they used to get bunch of fish, and people fish there and set their nets there, it said not to fish there. Not to take, no fish over there. There's a sign there and, just the past summer... Didn't say why, it's just take no fish over there. Probably, I was thinking, that maybe it's polluted. The fish are no good there. That's one of the reason why they put the sign up.

5.4 Impacts on Transmitting Traditional Ecological Knowledge

5.4.1 Loss of Natural Environment

The Alexis traditional land users stressed that if the industrial development activities continue, it will be impossible to teach the young generations how to live with nature, and eventually their traditional knowledge systems will most likely be destroyed. Participants said that they cannot teach how to live on the land if there is no wildlife, plants, forests and lakes. Their traditional knowledge has been taught from one generation to another, by taking children and youth to the land where they can see where the plants grow and how the animals, birds and fish live in forests, lakes, or rivers. Without abundant wildlife and healthy natural environment, there is no way for the elders to teach young people how to live with them. Daisy Potts expressed her concerns as follows.

> DP: ...as far as... hunting and fishing and medicine picking, I think it's going to be destroyed. Like I think we're gonna lose it if they don't stop doing what they're doing because we need that to teach our children. And if it's not there any more, we can't teach...I don't have the moose, I can't teach my grandchild how to make dry meat, and preserve it the way our people did to keep it. If we don't have the medicines, I can't show them where to pick or what to pick and tell them what it's used for to heal themselves...

Henry Bearhead emphasized that we have to consider the long run, and that we have to save some resources at least to some extent because there will be nothing for their children to depend on if the companies keep on taking all the resources now.

> HB: ... it hurts, you know, like what they're going to live on in the future? What they're going to depend on? That's a question I have to me. Because what they're going to live on in the future? If you take all the trees out now. You see, you got to, can't take everything out, you've got to save some. Somehow a person has to stop that. We have to think about the long run.

In fact, some interviewees mentioned that a certain number of people in the Alexis reserve have already started to lose their traditional knowledge and beliefs. Sylvester Mustus pointed out that recently not many Alexis Band members have enough skills to harvest, skin an animal, make dry meat, and to keep the meat fresh, though most of them did in the past. Sylvester described it as follows.

> S: In fact, I don't think a lot of them know how to harvest or skin an animal, you know. It takes some skill to do that. But I know one time most of our people did. There was a lot of skills, and healing, and hides and harvesting ...curing, animal meat, or dry meat, other ways of keeping the meat fresh, you know. Some of it, some people know, not too many people.

5.4.2 Sacred Sites being Developed

Sacred lands, ceremonial lands are being developed by companies, and the Alexis people are losing the places where they get together for traditional ceremonies. Traditional ceremonies are an important part of transmitting traditional values and beliefs to young generations, and losing such opportunities would be an obstacle in sustaining their culture. Ben Alexis referred to a big gas plant built on one of the important historical, ceremonial sites. Although the site has been considered a sacred place since ancient times until present, non-Aboriginal people have continued to give

pressure on Alexis people by building trails within that area. Recently, not many Alexis Band members visit the area since a large gas plant was built right on the ceremonial site. Ben explained that the area should have been preserved in some way before being developed. Ben Alexis described the situation as follows.

> B: ...well, there's one place where it's called a City Service Bridge. That's a historical ground, ceremonial grounds for ancient people as well as right up to modern day, I guess. And that area who seems like they really trying to, because Indians lived there till right till now, they're trying their best more or less getting us out of there. So they made a riding trail through there and quad trails and everything else, but we had those (unclear) preserve right up to this day... So this recent day I guess not very many people go there because there's a great, big gas plant on this side of that place. But that one area that should have been preserved a long time ago, I think.

5.4.3 Restrictions on Land Use

The land use regulations enforced by government officers often give pressures on the Alexis people's traditional camping activities, which also play an important role in transmitting traditional knowledge to children and youth. Helen Letendre revealed her experience of being expelled by a government officer from the land where she grew up, when she went out for camping with children. She has been out on this land for so many times in her life, and she feels like the land is her home, and she does not understand why she has to be forced out from the place by government officers.

> HL: But sometimes you know ...I've been out there so many times in my life, it's like

it's my home out there. Because sometimes when I get lonely out here you know, you get lonesome, I always get one of my kids to go out there, like the time we were out there you know, it make me feel good inside, and remember all the good things that happened over there. You know, it's my home over there. That land. And somebody was saying that, I don't know who, but some government people, they don't want us, we used to go out camping with the children with the school kids, you know, we wouldn't be allowed to go up there again. But that's our land! How can they refuse us, because when the school kids get out, you know, they all want to get some place and run around, and that's why they take them, and we went north of Edson one time, and we, the kids, they took them out for boat-riding ...to come in ...Athabasca, and that was a lot of fun for them kids to get out and enjoy themselves.

Sylvester Mustus emphasized that because of the strict time limits for camping, elders do not have enough time to teach their traditional ways to children. A lot of Alexis elders seem to be at a loss as to how they should transmit their traditional knowledge, when there are so many land use restrictions. He implied that if the people from the government prohibit them from staying on the land over a certain period of time, the traditional knowledge system can be lost in the near future. Sylvester described as follows.

S: ... the restriction left for camping, and for cultural purposes, you know. I don't like that. They shouldn't be restricted to camps, for so many days, you know. In order for us to teach our young kids, we might have to spend two, three, four months out there. We can't just teach them in two weeks (laugh). Before they can even understand it at least four or five months. You know, before you need some kind of understanding, you have to be going back, and okay, now. We need the space, and the land.

5.4.4 Destruction of the Traditional Community Structure

The concept of private property, reflected in many types of dominant land use

regulations, such as trap-line registration system, has destroyed the traditional community structure where everybody hunted and trapped by sharing their knowledge with one another. Alexis people, as well as many other Aboriginal communities, generally did not have a culture of owning something individually exclusively as a private property, because they always shared the resources and knowledge among the other band members. For instance, when there is a child who did not know how to trap, a well-experienced trapper in the band would teach where and how he or she can trap a desired animal. However, because the current land management system forces them to be registered in a particular trap-line, because it allows the use of a trap-line to only a few assigned individuals, and because it imposes a strict time limit, it has become difficult for them to share their traditional knowledge with others. Ben Alexis indicated that assigning of trap lines to each individual has split the people's ties apart. Sylvester Mustus also mentioned the same point. We can presume that the changes in the Alexis community structure have a significant impact on transmitting traditional knowledge, since now they have fewer opportunities to teach young people how to trap an animal, where to hunt birds, etc. Ben Alexis pointed out that since the government imposes the trappers to be registered in a particular trap-line, strong ties among Alexis Band members broke apart.

B: ...I think the broken connection, they start giving them trap-lines, make them

> leave this trap-lines ...that's the reason why people look for certain places they go to. There's a trap-line here, there's a trap-line there, but way back before that, people used to always live in a group...And they [white people] want certain hunting area they said, but once you signed this then that's yours for all kind... That's why you let the people apart! Not the idea people... stay together to do certain things together, but they are assigned to use trap [lines] again. But that wasn't our ways. Our ways were always to be together. That's what drove those things apart, I think.

Sylvester Mustus stressed that the connection in their community has been disturbed by a third party.

> S: ... they were able to share with the own people what they gather and help each other out. But how can we practice that when the access to this is stopped, it's stopping the connection in my community. One people trying to help another and it is stopped by a third party, you know.

Darwin Alexis emphasized that everybody in the community should be allowed to share trap-lines, since everybody is considered as family in their culture.

> DA: And then the time they spent, there's a policy on time they spend out on the trap-line, and they're trying to restrict it to just himself and his immediate family. But that has an effect too because ...as a nation, for First Nations people, everybody is family. So once you gather, you go to a cabin and anybody can use it or we camp together, that has a lot of effect.

Vernon Jones claimed that the entire Alexis culture will be lost if the current situation will not change. He said that conducting many interviews and documenting the elders' voices is the only way to preserve their knowledge and beliefs. Sylvester Mustus feared that we will not be able to learn about their culture in the near future, unless we visit museums. Angela Jones mentioned that everything will be lost, and

there will be nowhere to go. Although these prospects are far from what they wish, their voices reflect the degree of concern they are feeling under the current industrial development practices and land management policies. Vernon Jones expressed his concerns as follows:

> V: Well, we don't have a library in place today, if we don't start developing libraries and do a lot of interviewing and documenting knowledge that we have or one has in this community, it will be lost. You know, it will be lost forever and ever. Not only knowing about your traditional land, but also you know the way, the beliefs that we have... Otherwise our culture, our traditions, everything's gonna die. Even the songs. You know, the songs that are given to us, or you know, are passed on to us by our forefathers and some of us still continue today. Even that is gonna be lost.

5.5 Lack of Notification and Consultation

5.5.1 Companies Obtaining License without Consulting

My interviews revealed that neither the Government of Alberta nor most companies consult, and some may not even notify the Alexis people when they conduct oil/gas drilling, logging practices, and cattle ranching in or around their important traditional sites. Darwin Alexis pointed out that there were some oil wells constructed within the Alexis reserve, without any notification or consultation. Furthermore, several grazing leases were assigned right on Darwin's registered trap-line without any notification or consultation. The area was suddenly fenced off, although his right to use the trap-line was officially approved.

Vernon Jones referred to his experience of finding a large number of cattle that

suddenly started to roam on his traditional hunting ground. He did not receive any form of notification or consultation from the cattle ranchers or the Government of Alberta. He described his experience as follows.

> V: There's a lot of fencing happening. ...there's cattle in that area.... Like you know, one time when I was going down the highway down the road doing some hunting on the road... I thought I was going to see a whole bunch of moose or elk or something, then ...whole bunch of cows, all over the road! Cows everywhere! I mean this, where did these things come from? They must have broken out of a fence or something, they're everywhere... You know even that, they never even inform us what they were doing. After they logged out, they sent these animals in there, they fence it and just let them in there.

Vernon also mentioned that he did not receive any notification or consultation when oil/gas development and logging practices were conducted on his traditional sites. He said that they are always under threat as the companies or the government may not tell them even if a pipeline breaks or oil leaks out and pollutes the environment. Sylvester Mustus and Darwin Alexis expressed their frustrations toward the Government of Alberta, for giving licenses to the companies that never notify or consult with them.

In some cases, companies try to complete their consultation by making one phone-call to somebody on the reserve, but not calling those who are directly affected in their traditional land use rights by the development practices. In many cases, companies and the government notify the traditional land users after all the

development is completed. Thus, the Alexis people have very few opportunities to express their concerns regarding their traditional lands in the land use decision-making processes. Sylvester Mustus described his experiences as follows.

> S: Well, they say that they consult with us but I think ...they do consult with, a few people on the reserve, they might make a phone-call, one phone-call isn't consulting with the people. Like I never got a phone-call, where I was always at. I even leave my phone-number, my address with people I'm concerned, I never get a phone-call, but somebody from the reserve always gets a phone-call, and they claim that the one phone-call stands up for everybody, that they had an okay, they're doing what they're doing. We always hear after the fact. And when they bring something up after the fact, the elders are gathered, and after the fact information is given to us by government officials. But by then, they have already done what they want to do.

5.5.2 Companies Trying to Solve Conflicts by Compensation Payment

According to the Alexis traditional land users, in many cases, the government and companies try to solve the conflict only by compensation payment, and do not consult. However, Sylvester Mustus insisted that compensation does not solve the problem. He said that money will be used up soon, but the land will continue to provide food and all the necessary resources they need for their living for a long period of time. He expressed his concerns for people who easily give up their traditional lands just for money. Sylvester Mustus described his ideas as follows.

> S: ...when we talk about land cooperation, the first thing to say is compensation. I don't believe in compensation ...money will be taken and spent and gone. But the land ...when it's saved for somebody ...it's a lot better. We can use the resources more than the cash. Like I can use the moose meat, and the fish, and go out camping you know, I would like to enjoy more of that. And paying

compensation, but,.. logging or oil and gas, the first thing to say is compensation ...when they throw some money at our delegates, they grab it. So that kind of solves the argument but I think they should seriously consider about understanding where some of that land should be saved.

Vernon Jones also mentioned his experience of seeing the majority of Alexis Band members answering "yes" in front of a thousand dollars provided as compensation. Although money is still the ultimate decision-making tool to settle land claim conflicts, he also said that even a thousand dollars cannot last long, and that protection of traditional land is much more important.

5.5.3 Companies and the Government Not Willing to Consult

Even if the Alexis Band members try to consult with the industry workers or the government officers, they are often not willing to listen to their concerns or to discuss with them. Though Sylvester Mustus had a strong will to say something to companies and the government, he felt that they are not interested in dealing with the issue seriously. Sylvester appeared to be frustrated to see them not even trying to communicate with him equally. He described his experience as follows.

> S: But all this, I mentioned it to ...try to consult the oil and gas industry. And the only answer I get from them is that "We get our license from the province." "You answer it to the province." So I tried... talking to an official from a government office and they said, "Under the trappers' agreement, I don't have anything to say." "I don't have anything to say to an Indian trapper on what I deal with it." The government say so, you know, but ...under traditional gathering purposes, we might have something to say. A person has to live out there, in order to see this, on the land out there, it's part of my time. I'm one of the last trappers from here. I have a lot of

connection with the land.

Sylvester Mustus stressed that the Alexis people are being looked down on from the companies and the government, and that companies are only interested in maximizing profit by taking away their resources. He emphasized that this type of attitude has made it difficult for them to have an open and equal communication. Alexis traditional land users are not willing to provide information regarding traditional land use unless companies and the government change their attitude. Sylvester Mustus described his frustration as follows.

> S: I've been harassed by professional people out there, to get out of there. They're not very kind to anybody on the Crown land. Because of the money, profit, dollars they're interested in, they're not interested in saving anything. And in fact, rich business companies intentionally put over a historical site, they bulldoze, they clear it out, they clear the problem. See that's why some of our elders refuse to let them know where the sacred spots are. If they know where is this, they destroy everything. And they save the argument ...when they talked to me, ...I said I don't want to share any information because when I try to get information from them, they don't want to share anything with me ...they want everything from us but nothing from them... It's not very ...open communication.

The research findings presented throughout this chapter not only include empirical information based on direct and long-term observations by the traditional land users, but also involve interpretations and perceptions based on traditional values and spiritual beliefs. The former type of information is capable of contributing empirical information to build cause and effect relationships regarding impacts.

Descriptions regarding how a lake dried up after oil drilling occurred nearby the lake, or berries and medicinal plants disappearing where oil/gas drilling and cattle grazing took place, would be the examples of this type of data. The latter type of perception tends to be more inferential. Descriptions about a moose with lots of worms inside its body would be an example of the latter type of data for which the cause is not immediately observable, but traditional users may make inferences regarding sick animals based on, for example, their belief that this represents a symptom of disrespectful treatment of the land, a finding that is influenced by their traditional values and beliefs regarding appropriate relations between people and the land.

6. Discussions and Implications

In the first section of this chapter, I would like to examine the socio-economic and political factors that exist behind the infringement of Alexis people's traditional land use rights, by analyzing the different perspectives of First Nations, industry, and the Government of Alberta. The second and the third sections of this chapter will focus on the most significant findings among the data demonstrated in Chapter 5, which are the impacts of resource development and resource management policies on Alexis people's traditional knowledge systems, and the impact perceptions of industrial resource development on Alexis people's health conditions.

6.1 Continuous Infringement of Aboriginal Rights caused by Conflicting Interests and Persisting Political Power Structure

This section examines what factors underlie the issue of infringement of Alexis people's rights described in the previous chapter. First, I will review the major arguments observed in the existing literature and see if my research findings support them or not. Second, I would like to compare the statements of the Government of Alberta's First Nations Consultation Policy on Land Management and Resource Development adopted in May 2005 and the actual voices of the Alexis interviewees, and examine whether or not the actual voices corroborate the policy statements. Third,

I would like to discuss the fundamental causes underlying the overall problem, by analyzing the different positions of First Nations, industry, and the Government of Alberta.

Literature suggests that Aboriginal peoples' rights are being infringed upon due to a combination of various economic and political reasons. One of the major reasons of declining Aboriginal rights in this province is that the Government of Alberta and the industry share a common interest in promoting industrial resource development (Nadasdy, 1999). Since the entire economy of Alberta is largely dependent on natural resource-associated industries, particularly oil and gas, and because they provide the largest source of revenue to the provincial government, it is difficult for the government to suppress their economic development activities (Timoney and Lee, 2001). Sylvester Mustus supported this idea by saying: "...these [white] people work together. But they can't work with us." Vernon Jones also referred to this point as follows: "You know the... government is catered to industry. Because they're the ones that are giving lots of money... it was industry that pumped a lot of money into the government's taxes..."

Another huge obstacle in protecting Aboriginal peoples' rights is that the current land management system was not formed to protect or satisfy traditional land users' rights, but to benefit the provincial government and industry (Dickerson and

Ross, 2000). Although the Federal Government recognizes Aboriginal peoples' rights to pursue traditional lifestyles under the Canadian constitution, because the Government of Alberta owns most of the natural resources and has the power to control them, the provincial land use regulations are interpreted as preceding the Aboriginal rights (Dickerson and Ross, 2000). This is being caused by the Natural Resource Transfer Agreement (NRTA) signed in 1930, which transferred the control over natural resources from the Federal Government to the Government of Alberta, and allowed the provincial laws to apply to First Nations people (Schramm, 2005b). Because of this agreement, Aboriginal peoples in Alberta have had to comply with numerous changes in provincial regulatory frameworks that have gradually taken away the Aboriginal peoples' rights to access the land and resources in traditional ways. As we discussed in the literature review, the Alberta Game Act prohibited hunting of Bison, the Migratory Birds Convention Act regulated the hunting of ducks and geese, the signing of the NRTA took away the rights for commercial hunting, trapping, and fishing, and limited their activities on "unoccupied land", and registered trap-line systems restricted trap-line use to individuals (Schramm, 2005b). If a trapper fails to apply for an annual renewal within the time limit determined by the Wild Fur Industry Regulations, the trap-line will be considered abandoned (Alberta Trappers' Central Association, 1980). Further, firearms that Aboriginal peoples use also need to

be registered in order to purchase ammunition (Schramm, 2005b). These historical processes of disempowerment were strongly reflected in the research findings. Daisy Potts was frustrated to see numerous signs saying "Private property", "No hunting", and "No fishing"; Helen Letendre talked about her experience of being expelled from the land on which she grew up; Sylvester Mustus expressed his frustrations toward the strict time limits imposed on hunting; Darwin Alexis explained that Alexis elders cannot practice traditional activities because they are afraid of breaking the regulations; and Ben Alexis and Darwin Alexis were concerned about the trap-line registration system that does not allow them to share the trap-lines as they did in the past.

Moreover, in many cases, neither the Alberta Government officers nor the industry workers understand or respect the values of Aboriginal culture and traditional land use (MacKinnon, Apentiik, and Robinson, 2001). In fact, the majority of government officers and industry workers think that consultation with Aboriginal peoples is no more than a political tool to maintain control over the resources, and they generally have no interest in protecting Aboriginal peoples' rights (Nadasdy, 1999). Angela Jones, Vernon Jones, Ben Alexis, Helen Letendre, Sylvester Mustus, and Darwin Alexis all mentioned that the government officers and industry workers are not willing to listen to their voices and concerns, which strongly supports the

literature. As a result, the land management policies in Alberta have been developed in connection with the resource industries' interests but not with Aboriginal peoples' interests (Walther, 1987). Vernon Jones referred to this point: "...for me, it really saddens and it hurts me the fact that the [Ralph] Klein government doesn't seem to really want to help the First Nations people... You know, they're not doing anything to preserve our land... we have no policies and places to protect us, protect First Nations people."

Nevertheless, section 35 (1) of the 1982 Constitution Act of Canada approves the Aboriginal rights of Indian, Inuit, and Métis peoples to continue pursuing traditional lifestyles (Natcher, 2001). Moreover, the new consultation policy framework, which requires companies to consult with Aboriginal peoples when resource development may infringe on their traditional land use rights, was adopted by the Government of Alberta in May 2005. Here are some of the important guiding principles excerpted from this policy:

> 1. Consultation must be conducted in good faith.
> 2. Alberta is responsible for managing the consultation process.
> 3. Consultation will occur before decisions are made, where Land Management and Resource Development may infringe First Nations Rights and Traditional Uses.
> 4. While each has very different roles, the consultation process requires the participation of First Nations, the Project Proponent and Alberta.
> ...
> 6. Parties are expected to provide relevant information, allowing adequate time for the other parties to review it.

...

8. Consultation should be conducted with the objective of avoiding infringement of First Nations Rights and Traditional Uses. Where avoidance is not possible, consultation will be conducted with the goal of mitigating such infringement.

(Aboriginal Affairs and Northern Development, 2005)

Thus if this policy is effective, consultations should take place among the representatives of the Alberta Government, companies, and the Alexis Band members before any development practices proceed in traditionally important sites. And in case they find out that the proposed development activities may negatively affect traditional lands, companies and the Alberta government should make efforts to avoid or at least mitigate such impacts.

Despite the positive policy statements, many Alexis traditional land users mentioned that there is still not enough consultation or notification when their traditional sites are developed. Their voices revealed that oil wells are built one after another on their traditional lands and trap-lines, cabins used for hunting and trapping are being burnt down, sacred springs are fenced off, cattle ranching is taking place right on officially registered trap-lines, gas plants are built on sacred ceremonial sites, and herbicides are sprayed on traditional gathering sites, all with very little notification or consultation. Even if consultation is held, it is only through a short phone-call to a single person on the reserve, and it does not sufficiently reflect the band members' voices. Furthermore, Sylvester Mustus claimed that the government or

companies notify the Alexis people about the development plans after all the development practices are completed, and that they still do not provide enough opportunities for participation before decisions are made. Nevertheless, the Government of Alberta keeps on giving permissions for development to companies. Sylvester also mentioned that the ultimate tool for settling land use conflicts still continues to be compensation payment, and almost all Alexis interviewees said that government officers and industry workers are not willing to listen to their voices, even if they try to offer their views. Therefore, there seems to be no "good faith" between the Alexis people and the government or industry, and almost none of the policy statements listed above are being followed. All these facts support the ineffectiveness of the existing policy frameworks, and I conclude that the Government of Alberta's First Nations Consultation Policy on Land Management and Resource Development adopted in May 2005 does not ensure sufficient participation of Alexis' traditional land users. Having no legal constraints may give opportunities for companies to avoid notifying or consulting even if they are expected to do so.

However, according to one individual with whom I talked, the new consultation policy is still highly controversial, and it has not been approved by both First Nations' Chiefs (including the former chief of the Alexis Band) and the industry representatives due to different reasons. First Nations' Chiefs rejected this policy

because it does not reflect the reality at all, since they still have very few opportunities to participate in resource management decision-making processes. Alexis traditional land users' voices described in the previous chapter help us understand why the First Nations' Chiefs refused to approve this consultation policy.

On the other hand, industry is also unwilling to comply with this policy because they feel that this consultation policy imposes an excessive burden on the industry sector, as they believe that consultation for First Nations people is a provincial government's responsibility, since it is based on the treaty rights and the Natural Resource Transfer Agreement. Industry's concerns about consultation may be understandable. Generally speaking, industry's highest priority is to maximize profit, and clearly spending time, labor, and money for consultation processes are not beneficial for the industry. Further, consultation processes with Aboriginal peoples may diminish their proposed development plans. Although the consultation guideline mandates that the Government of Alberta has the ultimate responsibility for consultation, it is the industry who will have to spend a lot of money for compensation. Moreover, as we learned from the literature and research findings, the majority of industry workers do not understand or respect Aboriginal peoples' values (MacKinnon, Apentiik, and Robinson, 2001), and they tend to consider consultation as a political tool to maintain control over the natural resources (Nadasdy, 1999).

Sylvester Mustus expressed his frustrations toward the industry workers who look down on the Alexis people. Having no economic incentives and no interest in protecting Aboriginal rights, and viewing consultation as a government's responsibility, there seems to be little chance for the industry to comply with this consultation policy, unless there is a legal constraint.

Finally, I would like to discuss the provincial government's position. The existing literature points out that since the Government of Alberta heavily relies on the revenues from industry, the government cannot suppress the industry's economic activities (Timoney and Lee, 2001). Moreover, existing research suggests that the political nature of the Alberta Government is said to be very conservative compared to that of other provinces in Canada (e.g. British Columbia) (Timoney and Lee, 2001). The Government of Alberta has a history of avoiding institutional reform and developing superficial policies only to maintain its political legitimacy (Davidson and MacKendrick, 2004). Based on these ideas, the Government of Alberta likely is unwilling to force the industry to comply with the consultation policy by imposing a legal constraint. Because the government does not want to hinder the industry's resource development activities, and because the government is highly conservative, I argue the Government of Alberta is unlikely to go through the drastic institutional reforms needed to protect Aboriginal peoples' rights. In other words, the government

has incentives to overlook failures by industry to follow consultation guidelines. Although the government may seem to have made some efforts in developing new consultation guidelines, they neither imposed any legal constraints for consultation nor reformed the resource allocation processes to force the industry to consult. All they did was to develop a guideline that is hardly followed by the industry.

To conclude, under the current situation, it is nearly impossible to make the new consultation policy effectual. The conflicting interests encompassing the consultation policy as well as the research findings have reconfirmed the distinct positions of the First Nations, industry, and the government in Alberta, which have created the unfavorable conditions for the Alexis people. The situation might have been different if all three parties had equal political power, but since the political power is still concentrated with the industry and the government, the stronger parties have ended up suppressing the powerless Alexis people. This imbalance of political power underlies the infringement of the Alexis people's traditional land use rights. Vernon Jones made an interesting comment in his interview: "We have to put some policies into place to govern the government and the industry." As he stated, the industry and the government still appear to be the most fundamental obstacle for the Alexis people to pursue traditional lifestyles.

6.2 Impacts of Resource Development and Regulations on the Alexis People's Traditional Knowledge Systems

The majority of existing literature concerning traditional knowledge refers to topics such as the difference between traditional knowledge and scientific knowledge, difficulties or potentials of incorporating traditional knowledge into current resource management, and lack of respect or understanding toward traditional knowledge among government officers and industry workers, but few have clarified the process of how traditional knowledge is being affected by contemporary resource management regimes. One of the most significant findings from this research indicates that in addition to environmental degradation, enforcement of dominant land management regulations have a huge effect on Alexis people's traditional knowledge systems. Based on the research findings and existing literature, this section intends to illustrate how the Alexis' traditional knowledge systems are being affected under the resource development activities and current land management policies, and what particular factors are underlying this process.

The most direct factor that is negatively affecting the Alexis people's traditional knowledge system is the loss of a healthy natural environment and sacred sites, which effectively serve as traditional knowledge "laboratories." The Alexis traditional land users mentioned that they have fewer and fewer opportunities to pass

on their knowledge, beliefs, and their traditional ways of life to younger generations because the surrounding environment is being heavily degraded due to industrial development. Daisy Potts stressed that if they do not have the wildlife, they cannot teach the children how to hunt, trap, and preserve the meat; she also mentioned that if they do not have the medicinal plants, they cannot teach them where and what to pick, and how to heal themselves. Ben Alexis referred to a large gas plant built on a sacred ceremonial site. This also deprives Alexis' children of their opportunities to learn about their traditional values and beliefs through participating in traditional ceremonies.

The research findings also revealed that the current land management regulations are destroying the traditional knowledge systems of the Alexis community through the imposition of a system of trap-line registration and time limits. One of the major factors is the trap-line registration system introduced in 1939, which limits the use of a single trap-line to a trap-line holder and his/her immediate family members. In the old days, Alexis people lived in family groups with strong ties to the extended family and overall community, and they shared their knowledge regarding where and how they can trap desired animals among the extended family. Each family had a trap-line in their traditional territory, and trap-lines often crisscrossed each other. New trappers were generally allowed to set their traps as long as they asked for permission

from the head of the local family. Because everybody in the extended family worked together by sharing their trap-lines, children and youth had sufficient opportunities to learn from elders, while adult trappers could also improve their skills by learning from well-experienced trappers. For instance, in the old days, if a young family member did not know how to trap a beaver, an experienced trapper would teach how to trap them on his or her trap-line.

However, under current regulations, if the unskilled person was not registered as one of the trap-line holders and is not a child of the registered trappers, he or she is not allowed to stay at the trap-line and will be expelled from the spot by government officers. Darwin Alexis described the traditional community structure as "everybody is family", and he expressed concerns toward the current land management regulations that do not fit into their traditional way of life. Ben Alexis insisted that because the government started to assign a trap-line to an individual or a few limited people, the strong community ties they had in the past broke apart. Since the government officers strictly limit the uses of trap-lines only to registered trap-line holders, many trappers can no longer teach the young people or share their information with the other band members even if they want to. Thus, the trap-line registration system largely reduces the opportunity for the Alexis Band members to maintain their traditional knowledge and to transmit it to the next generations.

Moreover, it appears that Alexis people are becoming more individualistic, losing their sense of working together and helping each other. Sylvester Mustus mentioned that the Aboriginal youth today cannot work together in a group or respect others as much as they did in the past. Amongst other factors, the imposition of the dominant land management system is destroying the basis of the traditional Alexis community structure, and is having an enormous effect on maintaining and transmitting their traditional knowledge.

Another factor is the severe time limit enforced on hunting. Sylvester Mustus recalled his old days when they could stay on the land as long as they wanted. He expressed his frustration with the current regulation that allows them to hunt only for two weeks, and he emphasized that they cannot transmit their traditional knowledge, traditional beliefs, and hunting skills to the young people within such a short time length. He explained that they will need at least four to five months for the young people to have some sort of understanding about their traditional hunting culture. Sylvester Mustus expressed his overall concern as: "...a lot of our elders are stuck with direction of how are we going to teach our young people you know... We're standing now and say, how are we going to teach that, when there's so much law, so much restrictions?"

The underlying causes for this issue can be considered as the following two

points: fundamental differences in how people view natural resources, and the concentration of political power in the dominant culture. As we learned from the literature, Aboriginal peoples generally ascribe to the view that all living organisms including humans are to share resources with everybody on the land, while the dominant culture views natural resources as private or state properties (Stevenson, 1998). Needless to say, the Alexis people's traditional land use practices are based on the former idea, and the current land management regulations are built upon the latter view. Invisible conflicts are occurring between Alexis people who want to share resources and knowledge within their community, and the government officers who want to distribute the resources "appropriately" to each individual as a private property.

Alexis participants seemed to have difficulties in accepting the government officers' approach in restricting everything to an individual level, and based on the literature, I assume that many government officers and industry workers also do not recognize the distinct view Aboriginal peoples have toward the land and resources. Although it might be best if both cultures are equally respected, the reality is that one culture with more political power is taking over the other powerless culture. In other words, the government has the power to impose their ways of managing natural resources on the Alexis people, and the Alexis peoples are being forced to change

their traditional way of life under the dominant land management regulations.

6.3 Declining Health Conditions and Shortening Life Expectancy

We learned from the literature that scientists have found a variety of environmental contaminants in the Aboriginal peoples' traditional diet, particularly in the northern region of Canada, and that they might have been exposed to health-associated risks (Berti et al., 1998). Moreover, other researchers suggest that shifting of diets from traditional food to non-traditional processed food among Aboriginal peoples is causing health problems such as diabetes, mainly due to increased intake of fat and sugar contained in non-traditional food (Reading, 2003; Willows, 2005). Despite such research findings, many Aboriginal health issues remain unknown, and very little research has been conducted in Alberta. Alexis people's voices regarding health problems not only supported the existing literature, but also indicated that reduced opportunities for gathering traditional medicines are of a great concern. In addition, they indicated the possibility that serious Aboriginal health issues might exist in Alberta, just like in the Arctic. This section will illustrate the Alexis people's perceptions on how industrial resource development may affect their health conditions.

Ben Alexis, Darwin Alexis, Henry Bearhead, and Sylvester Mustus referred to

the declining health conditions among the Alexis Band members. They all feel that the Alexis people are becoming more susceptible to sicknesses because of the industrial resource development and the land use regulations. Sylvester Mustus asserted that the Alexis Band members' life expectancy has been shortened from 80-100 years to 40-50 years, compared to 50-60 years ago. Ben Alexis mentioned that "doctors were unheard of" in the past, but now Alexis people are suffering from all kinds of sicknesses and many of them are frequently seeing a doctor. Ben thinks that environmental contamination such as water pollution, acid rain, and air pollution are negatively affecting Alexis people's health. Ben expressed his concern: "I don't really know where it's safe to live in Alberta any more, because of the gas development and all that."

Daisy Potts, Angela Jones, and Ben Alexis stressed that not only because wildlife populations are rapidly declining, but also because more and more wildlife are getting sick, they cannot depend on wild meat as they did before. Daisy Potts said: "For us native people... our game were really, it was a really healthy lifestyle for us, but now... we got to be aware of what we kill and what we catch, what we eat because they could be sick." Angela Jones expressed her concern as: "...whatever we eat, they spoil now, and I don't know what else we eat." This situation increases their reliance on non-traditional processed food, which Henry Bearhead and Darwin Alexis

feel exacerbates their health conditions. Henry and Darwin think that one of the reasons for the increase of sicknesses is that they are increasingly dependent on processed food rather than traditional food. They mentioned that there are some diseases such as cancer and diabetes that they never had experienced in the old days, when they had enough healthy wild meat to eat.

Moreover, many Alexis representatives referred to a drastic decrease in opportunities for gathering traditional medicines. Sylvester Mustus pointed out that modern medicine often does not work for their bodies, and thus having not enough access to traditional medicine deprives them of opportunities to maintain their health conditions and to cure their illnesses. Therefore, according to the Alexis representatives, increasing environmental contamination, decrease of available wildlife meat, increased reliance on processed food, and reduced availability of traditional medicine altogether is aggravating their health conditions, possibly leading to shortening of their life expectancy. Again, it is important to note that this finding does not uncover scientific cause and effect relationships, but it illustrates how the Alexis people think and feel about the current situation. There is a need to conduct scientific research to clarify what exactly is causing health problems in the Alexis community.

This research finding indicates that the ongoing industrial resource

development may have direct implications for Aboriginal people's health conditions. In addition, it also demonstrates the degree to which Alexis people are powerless to change their situation, and how powerful government and industry are, given that Alexis people cannot respond to their health condition in an appropriate way. There seems to be no sign of change in the existing political power structure, and the local impacts on Alexis people seem to be getting worse.

6.4 Suggestions – Increasing Training Opportunities and Raising Environmental Justice Movements

Through the discussions above, we reconfirmed that from the perspectives of the Alexis people, the biggest obstacle underlying all the issues is the disproportion of political power between the Aboriginal and non-aboriginal sectors. Consultations are still not done properly because the government and the industry has the power to make final decisions, traditional knowledge systems are being destroyed because the Alexis people can only obey the rules imposed by the government, and Alexis people cannot do anything about the factors they feel are causing illnesses because they do not have the political power to do so. Thus, it is extremely important to dissolve this imbalance and create a common foundation where both sides can participate equally in resource management decision-making.

Increasing training opportunities for both non-aboriginal and Aboriginal youth should be an effective approach to achieve the goal stated above. To make non-aboriginal people and Aboriginal people communicate equally, both must make efforts to understand each other's values, particularly since these two groups have extremely different views. As we learned, Alexis Band members feel that non-Aboriginal people generally do not understand or respect Aboriginal culture. Therefore, society should provide more opportunities for university students majoring in natural resource -related subjects to learn about Aboriginal peoples' distinct values and beliefs, for they will be the future government officers and industry workers. Currently, most university students who are planning to work for oil/gas and forestry industries are not required to take courses related to Aboriginal culture, although they will definitely encounter this issue when they start working in this field. Considering the increasing need to work with Aboriginal peoples in contemporary resource management, it would make obvious sense to require students to complete a course related to Aboriginal culture. This would provide a good opportunity for non-aboriginal people to better understand the distinct values, beliefs, and politics of Aboriginal peoples, and to broaden their views, enabling them to communicate with Aboriginal peoples in a more respectful manner when they become government officers or industry workers.

Training for Aboriginal youth is another important aspect. Since the dominant decision-making processes are largely based on scientific knowledge and quantitative data, and because the people with the most power are usually highly educated, Aboriginal peoples would benefit from having some scientific background as well as good English communication skills, in order to increase the effectiveness of their communication with non-aboriginal people. However, this does not mean that Aboriginal youth should be completely assimilated into the dominant culture. It would be best if they could maintain their sense of traditional culture, and also achieve a high-level education at the same time. Having enough scientific background would enable them to compete equally with the government officers and industry workers in the resource management decision-making processes.

I would also like to suggest the Alexis community consider presenting to the government their current status concerning health conditions in connection to directly claiming their rights for traditional land use activities. Existing literature suggests that health or welfare-associated impacts imposed on poor and powerless people generally pull stronger attention and sentiments from civil society and states (Frickel and Davidson, 2004). Environmental justice movements, which connect environmental risk and community health or welfare problems, have a greater potential to make an institutional reform in a society (Martinez-Alier, 2000, Bullard, 1993, Szasz, 1994,

Uyeki and Holland, 2000 as cited in Frickel and Davidson, 2004). Based on this argument, the subject "alleviation of impacts on Alexis people's health" may be far more effective in drawing the government's attention, compared to topics such as "protecting Alexis people's rights to hunt animals". Ignoring people who are suffering from sicknesses could well be deleterious to the careers of elected officials, and thus it would have more chances to be put on the agenda.

In order to do so, further research is necessary to support their voices from a scientific standpoint. Though many researchers have studied how gender, age, income, education, etc. relates to Aboriginal people's health, few have studied what types of environmental contaminants are contained in terrestrial mammals observed in rural Alberta, or how reduced access to terrestrial mammal meat and traditional medicines may affect Aboriginal people's health, in Alberta. If their voices can be supported by scientific data, and if the data suggests that industrial resource development is the root cause of their health problems, it would certainly strengthen their position when claiming their traditional land use rights against the government, and for seeking meaningful participation in the land management process.

7. Conclusion

A number of scholars come to believe that Aboriginal peoples have learned how to wisely utilize their surrounding natural resources without destroying the environment, through millennia of experience of living with nature (Wolfley, 1998). Researchers refer to such Aboriginal peoples' knowledge, practice, and belief as Traditional Ecological Knowledge (TEK), and the ways of living as traditional land use. The Alexis Nakota Sioux Nation, who has their origin in the Stoney group, is said to have lived in the foothills of the Rockies west of Edmonton since 1650 or earlier (Laurie, 1957 as cited in Andersen, 1971). With a spiritual belief that everything in nature including humans was placed by the Creator and is a source of spiritual force and sacredness (Marino, 2002), the ancestors of the Alexis Nakota Sioux Nation have lived off the land through hunting, trapping, fishing, and gathering (Andersen, 1971). Along with the settlement of the Europeans, a number of legal restrictions have been imposed on Aboriginal peoples' traditional land use practices (Schramm, 2005b). Further, while oil/gas development, forestry, and cattle ranching have largely contributed to the Alberta's prosperity, the boreal ecosystem, which has been essential for sustaining Aboriginal peoples' traditional lifestyles, has been enormously impacted by such resource development activities (Schneider, 2002).

Although some people still hold skeptical views toward traditional land use

and TEK, Aboriginal peoples' rights have been drawing attention world-wide along with the increasing environmental awareness (Hayashi, 2006), and it has led to various policies and legislations that affirm the values of traditional land use and TEK. However, due to numerous loopholes in the current legal frameworks (Ross, 2003) and persisting political power structure, many Aboriginal communities claim that their concerns regarding traditional land use remain excluded from the resource management decision-making processes (Natcher, 2001).

The objective of this study was to explore the Alexis traditional land users' perspectives toward the impacts of resource development, and to illustrate the process of how their traditional knowledge systems have been affected by resource development and the current resource management policies. In-depth interviews with eight Alexis traditional land use experts revealed that oil wells are built one after another on their traditional lands and trap-lines, cabins used for hunting and trapping are being burnt down, sacred springs are fenced off, cattle ranching is taking place right on officially registered trap-lines, gas plants are built on sacred ceremonial sites, and herbicides are sprayed on traditional gathering sites, all with very little notification or consultation.

The research findings suggested that the Government of Alberta's First Nations Consultation Policy on Land Management and Resource Development

adopted in May 2005 did not ensure appropriate participation of Alexis traditional land users at least at the time when interviews were conducted. I argue that the continuous infringement of Alexis people's rights are caused by a combination of conflicting interests of each stakeholder and the concentration of political power in the industry and the government. Having no economic incentives and no interest in protecting Aboriginal rights, and viewing consultation as a government's responsibility, there is little chance for the industry to comply with this consultation policy. It is also difficult to expect that the Government of Alberta will go through a drastic institutional reform or force the industry to consult, because of its heavy reliance on the industry's revenues and its politically conservative nature (Timoney and Lee, 2001). The industry and the government still appear to be the biggest obstacle for the Alexis people to pursue traditional lifestyles.

Another major finding from this research is that in addition to the environmental degradation caused by industrial activities, the current land management regulations such as the trap-line registration system appear to be huge obstacles in transmitting TEK to the younger generations. In the old days, the Alexis people shared their knowledge regarding where and how they can trap desired animals among all the members of the community. However, because the trap-line registration system only allows registered individual or his/her children to stay on the trap-line,

they had their strong community ties broken apart, and they have lost much of their opportunities to share their traditional knowledge with others. I argue that the fundamental differences in how people view natural resources, and the concentration of political power in the dominant culture underlie this issue. Aboriginal peoples generally consider that all living organisms including humans are to share resources with everybody in the community, whereas the dominant culture views natural resources as private or state properties. The government who has the power to impose their ways of managing natural resources on the Aboriginal peoples has forced the Alexis people to change their traditional way of life under the dominant land management regulations.

In addition, this research has also found that a number of Alexis traditional land users think that their health conditions are being negatively affected by resource development activities. According to the Alexis interviewees, increasing environmental contamination such as water pollution, acid rain, and air pollution, decrease of available wildlife meat, increased reliance on non-traditional processed food, and reduced availability of traditional medicine altogether is aggravating their health conditions. However, having little political power, Alexis people do not have the means to improve their situation.

Since the imbalance of political power appears to be the fundamental cause

for the overall issue, it is extremely significant to dissolve this imbalance and establish a common ground where Aboriginals and non-Aboriginals can participate equally in resource management decision-making processes. For this purpose, I suggest to increase education and training opportunities for both non-Aboriginal and Aboriginal youth. By providing university students majoring in natural resource related subjects with more opportunities to learn about Aboriginal peoples' distinct values and beliefs, they can broaden their views and communicate with Aboriginal peoples in a more respectful manner when they become government officers or industry workers. On the other hand, Aboriginal youth should also obtain enough scientific background in order to compete equally with the government officers and industry workers in the resource management decision-making processes.

Finally, I would also like to suggest the Alexis community to present their status regarding health conditions to the Government of Alberta supported by scientific data. Existing literature suggests that health impacts imposed on powerless people pull stronger attention and sentiments from the society, and thus have a greater potential to make an institutional reform in a society (Martinez-Alier, 2000, Bullard, 1993, Szasz, 1994, Uyeki and Holland, 2000 as cited in Frickel and Davidson, 2004). Thus, if a set of scientific data can suggest that industrial resource development is causing their health problems, it would certainly strengthen their position when

claiming their traditional land use rights against the government.

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Appendix A

Summary 1: Alexis People's Impact Perceptions of Resource Development on Hunting, Trapping, Gathering, and Fishing

	Impacts on Hunting/Trapping Wildlife	Impacts on Gathering Berries and Medicinal Plants	Impacts on Drinking Water and Fishing
Oil/Gas Development	Oil drilling contaminates wildlife habitat, Pollutants spilled in water make wildlife sick	Clearing, digging, and plowing of land kill the roots of berries and plants and dries up the soil, eventually reduce berries and plants	Oil/gas drilling pollutes water and drops the lakes' water levels
Forestry	Clear-cutting destroys wildlife habitat, Spraying of herbicides/pesticides makes wildlife sick	Spraying of herbicides/pesticides reduces abundance and quality of berries and plants	
Cattle Ranching	Grazing and trampling by cattle reduce wildlife habitat, Ranchers burn down cabins for leases	Grazing and trampling by cattle kill berries and plants	
Land Use Regulations	Imposition of trap-line registration and firearm license hinder hunting/trapping		Signs hinder fishing

Summary 2: Alexis People's Impact Perceptions of Resource Development on Traditional Knowledge and Health Conditions

	Impacts on Transmitting Traditional Ecological Knowledge	Impacts on Health Conditions
Oil/Gas Development	Destroy forests and lakes, reduce wildlife and plants, and destroy sacred ceremonial sites, eventually deprive Alexis people of their opportunities to transmit TEK	Contaminants from oil/gas development pollute the air and water, make wildlife sick, promote their reliance on non-traditional food, Oil/gas drilling kills medicinal plants
Forestry	Destroy forests, reduce wildlife and plants, eventually deprive Alexis people of their opportunities to transmit TEK	Clear-cutting reduces wildlife, Spraying of herbicide/pesticide make wildlife sick, promote their reliance on non-traditional food, and kill medicinal plants
Cattle Ranching		
Land Use Regulations	Trap-line registration and time limits for hunting reduce opportunities for transmitting TEK	

Appendix B

Information Sheet: Invitation to Participate in Research

Project Title:
Impacts of Resource Development on Traditional Land Use and Traditional Ecological Knowledge of the Alexis Nakota Sioux Nation

Researchers:
Yuki Arai, Graduate Student
Phone: (780) 695-2973, Email: yukiarai_alberta@yahoo.co.jp
Department of Renewable Resources, University of Alberta
Mailing Address: 751 General Services Building, University of Alberta, Edmonton, AB, CANADA T6G 2H1

Dr. Debra Davidson, Supervisor
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Mailing Address: 543 General Services Building, University of Alberta, Edmonton, AB, CANADA T6G 2H1

Project Description:
As an elder of the Alexis Nakota Sioux Nation, you are invited to share your perspectives on current land uses in Alexis traditional territory, and their impact on traditional land use. This research is a part of a larger initiative on the part of the Alexis Nation to collect and store the traditional knowledge and perspectives of their elders. The specific objective of the current research project is to explore the impacts of industrial resource development (i.e. logging, oil and gas extraction) on traditional land use practices (i.e. hunting, trapping, gathering, fishing) and surrounding ecosystems from the perspectives of the elders of the Alexis Nakota Sioux Nation, a community that has been subjected to heavy industrial activity on their traditional land base. The findings from this research will provide useful information for the promotion of improved relationships among the government, industry and First Nations communities, and will provide a valuable historical record of local knowledge, culture and practices for the Alexis Nation.

If you agree to participate, a graduate student, Yuki Arai, will meet with you at a time and place that is suitable for you, and will ask you some questions. The interview will be recorded on audio and video tape, and will take approximately one or two hours. A translator or other research assistant may also be present. You may refuse to answer questions you are not comfortable with, or quit at any time. If you should decide after the interview is complete that you do not want to participate, you can let the researchers know up to two weeks from the time of the interview, and all recordings and notes will be destroyed.

It is important that you are aware that the interview is not being conducted in confidence. Your name will be recorded, and the audio and video recordings of the interview will be stored in the Alexis Land Consultation Office, and accessible by community members for

the purpose of research and education. You may, however, request that we do not use your name in any papers about this research project. Unless you specifically request otherwise, your name may be identified in papers.

Use of Data:

The information generated from this research will contribute to a Master's Thesis for Yuki Arai, and stored in the library at the University of Alberta. The Land Consultation Office will also receive a copy of the Master's Thesis, and the researchers may write papers for publication in academic journals as well.

Contacts:

If you have any concerns and would like to discuss this project with someone other than the researchers named above, you may contact either:

Dr. Tanja Schramm, History Project Coordinator of the Alexis Nakota Sioux Nation
Phone: (780) 967-4878, Fax: (780) 967-5484,
Email: tschramm@alexisnokotasioux.com
P.O.Box 7, Glenevis AB T0E 0X0

OR

Georgie Jarvis, Research Office Coordinator, Office of the Associate Dean (Research), Faculty of AFHE, University of Alberta
Phone: (780) 492-8126, Email: Georgie.jarvis@ulaberta.ca
2-06H AgFor Centre, Edmonton AB T6G 2P5

Appendix C

Oral Statement for Informed Consent

Before we continue, I just want to make sure you understand what is being asked of you.

I will ask you some questions regarding traditional land use and impacts of industrial resource development. Our discussion will take approximately one to two hours, and will be recorded by an audio tape recorder and a video camera. Other people may be present during our discussion, including a translator or an assistant to hold the video camera.

This interview will not be confidential. That means that your name will be recorded, and the audio and video recordings, in which you will be clearly identified, will be made available to other members of your community in the future. You may, however, request that we do not use your name in any papers; just let the interviewer know.

Data collected through this interview will be used for my Master's Thesis and for academic publications.

After finishing the analysis, the data will be returned to the Alexis Nakota Sioux Nation and will be stored in the Alexis' Land Consultation Office, along with a copy of my Master's Thesis, and will be made available to other community members for research and education.

Finally, participation in this project is completely voluntary, and you have the right to quiet at any time during our discussion. If you change your mind about participating in this study within two weeks of today's interview, I will destroy all the audio-visual recordings of our conversations, and all transcripts and written notes that I may have taken will also be destroyed.

Would you like to participate?